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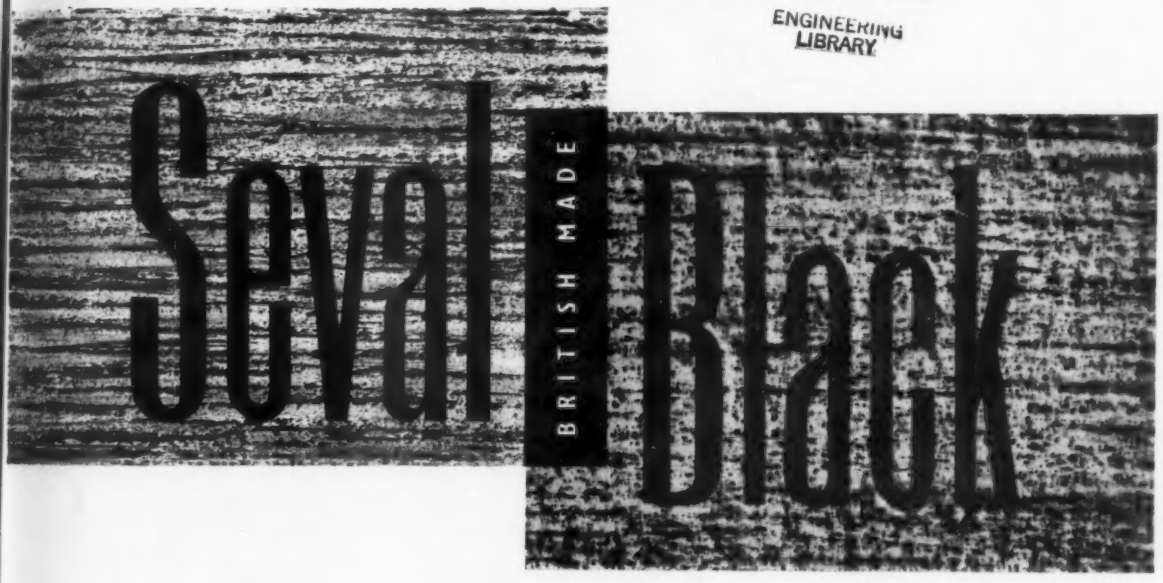

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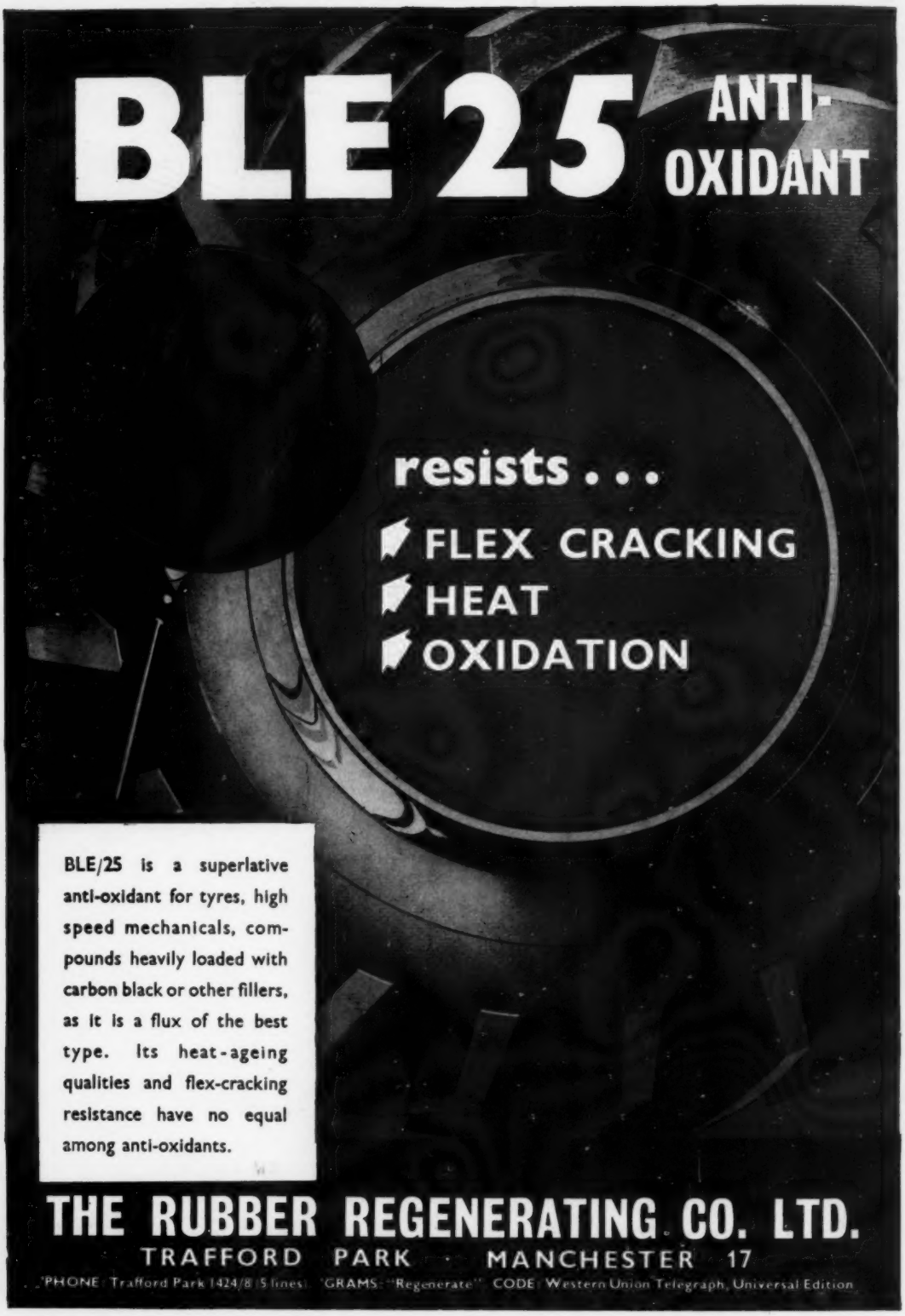
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IN ITS 75th YEAR

May 16 1959

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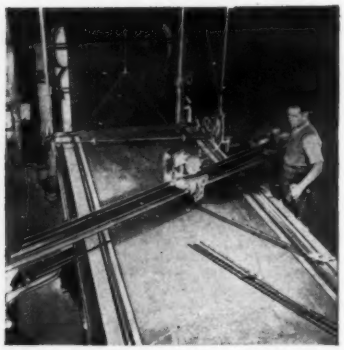

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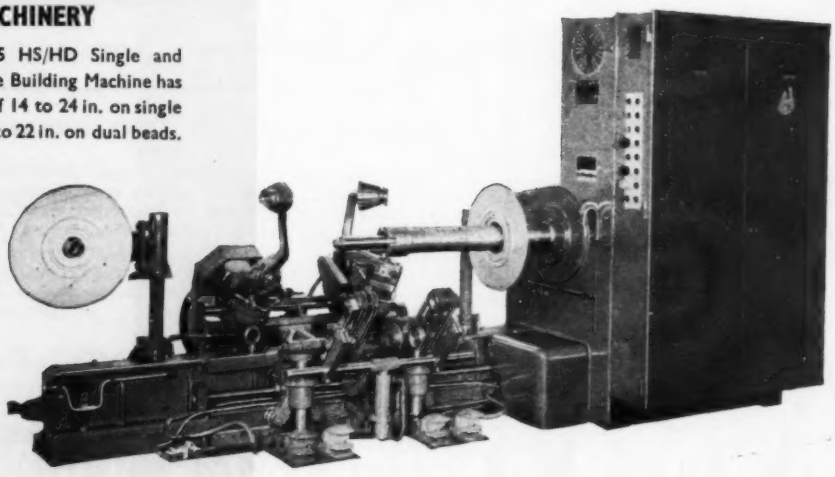

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NOTES of the WEEK

Challenge to Businessmen

A SUMMARY of an address * by Dr Charles Malik, Foreign Minister of the Lebanon and President of the United Nations General Assembly, appears in the Spring issue of the Esso magazine. From an international viewpoint, and particularly in relation to any complacency which may exist in the West today, the address, which should be read in full, is not only of great importance but one that deserves careful thought. Dr Malik spoke of three challenges to Western society: the problem of its own development; the challenge of Communism and that of the wakened peoples of Asia and Africa. Western society had to ask itself, he said, how freedom could be reconciled with the growing pressures of government; whether the rise of ' the common man ' entailed a decline in creativity; whether material abundance stood in the way of spiritual achievement and of faith; and whether it could prevent the enemies of freedom from making use of freedom in order to destroy it. Ideologically, said Dr Malik, Communism challenged Western beliefs. He went on, 'And with respect to competition with the West in the unaligned areas, it appears that Communism is more resourceful and successful in penetrating the ideas and systems and allegiances of those peoples than the West. It follows from all this that the West can no longer be smug and self-satisfied . . . it must honestly search into the strengths of Communism.'

Need to Adjust

THE businessman, said Dr Malik, ' must adjust at once to the forces of his own society, to the dynamic character of Communism everywhere, and to the rapidly growing requirements of the underdeveloped world. Primarily, the businessman—in the widest sense of the word—is interested in the production of good products or services that will sell. On this depends his profit or remuneration. The goodness of the product or service presupposes some objective standard.' Business discovers and the public recognizes this standard of excellence, said Dr Malik. He went on to say that in the multiplication and perfection of material things, there seemed no limit to human inventiveness. ' This unlimited power of man to invent and create, this infinite docility of the material world for being reformed and redirected, this perfect readiness of the forces of nature to disclose themselves, in all their beauty and usefulness and terror, to the disciplined mind—all this bespeaks a profound and great mystery. He who misses the religious significance of this fascinating material civilization, with its infinitely multifarious goods and gadgets, misses the heart of the matter. For man and nature are perfectly made for each other: nature to serve man and man to exploit nature. The Communist stops there. But those of us who belong to the older traditions cannot possibly stop there.'

Its Own End

FUNDAMENTALLY, said Dr Malik, it was a question as to whether business was its own end. ' If nature is for the sake of man, the question naturally arises, then man is for the sake of what? Is he just for the sake of himself? This is the answer of Communism and of Western secularism. But if the Western businessman is fully aware of his roots and the roots of his culture he cannot possibly give this answer. And it is at this point that the total perspective of Communism's challenge to the businessman really begins to open up.' The Communist challenge, said Dr Malik, had to be understood as a peaceful one—' he alone has a right to war who has made full use of his right to peace.' The challenge in the field of scientific and technological development and research was such that ' unless the effort at the formation of scientists and technicians and at the promotion of pure and applied research is considerably intensified, the West is heading towards an inferior position in the foreseeable future.' Dr Malik went on to say that the great problem was whether the West was sufficient unto itself or whether it had a genuinely universal message. The businessman's humanity was at stake. He ended, ' Rising above his individual interests to the proper consideration of the common good . . . his spiritualized materialism will have something profound to say and to give to all men. He will identify himself with their human state. He will be proud of its achievements, but he will be even more proud of that which is beyond business in his own culture. He will say: let others compete with me in material things and let them even excel, but there is one thing in which they cannot excel because they do not know it and are not even seeking it, and that is the power and depth and freedom of the spirit in which man is fully himself. In this way Communism's challenge to the businessman will turn into the businessman's challenge to Communism.' Dr Malik then referred to a lecture given to the Harvard Business School 27 years ago by Professor A. N. Whitehead, ' my honoured professor and teacher.' All he had said, he explained, was mere commentary upon one sentence from that lecture: 'A great society in which its men of business think greatly of their functions.'

**This speech was presented at the Harvard Business School's 50th Anniversary Conference held in Cambridge, Massachusetts, last year. A complete edited summary of the ideas presented at the Conference, including this speech, will be published in book form under the title,* Management's Mission in a New Society, *by the McGraw-Hill Book Company early this year.*

NEWS *Briefs*

WEST GERMAN PLASTICS — ICI FACTORY FOR NORTHERN IRELAND — INDONESIAN OUTLOOK PERSIAN TYRE PLANT — US GOODYEAR SALES

●**France**—French rubber purchases in Vietnam are expected to be resumed shortly following a financial agreement between the two countries concluded last week in Saigon, French rubber trade quarters report. Under the new agreement, Vietnamese rubber will be sold at world prices against transferable francs. French rubber buying in Vietnam ceased in January when the Vietnamese Administration would no longer grant export licences against French francs.

●**United States**—The new US Industrial Chemicals Co. polythene plant at Houston, Texas, has achieved full-capacity operation — just six weeks after its start up. This was reported by William Rader, manager of polythene production for the US division of National Distillers and Chemical Corporation. Quality of the product at this early date, according to Mr Rader, has exceeded expectations, with a significant portion of the output meeting highly critical film-grade specifications.

●**Holland** — Plans by Continental Carbon Co. to construct a carbon black plant at Rotterdam costing $2,500,000 have been announced by the president of the company, Mr R. I. Wichnick. This plant will produce about 15,000 tons of high abrasive carbon black and will be on stream early in 1960. In addition to this Dutch company, there are plans to build in France, in collaboration with the Phillips Petroleum Co., a plant for the manufacture of the full range of blacks ISAF, HAF and FEF.

●**West Germany**—In 1958 West Germany produced about 640,000 tons of plastics, making her the world's second largest producer after the United States but before Britain. This is stated by Herr A. Jebens, director of the Badische Anilin und Sodafabrik of Ludwigshafen, one of West Germany's biggest chemical companies, at a reception here. World production was about four million tons of which about half was produced in the United States. Herr Jebens said his company contributed about one-third of West German production.

●**Northern Ireland** — I.C.I. has recently concluded negotiations for the purchase of options on some 200 acres between Carrickfergus and Kilroot, Co. Antrim, as a site for a future 'Terylene' spinning plant. 'Terylene' polyester fibre is at present being manufactured at Wilton in the North Riding of Yorkshire. A survey of the new site will be undertaken in the course of the next few months and it is hoped to begin work upon it during 1961 with a view to starting production in 1964. When full production has been achieved, a labour force of about 1,150 will be required.

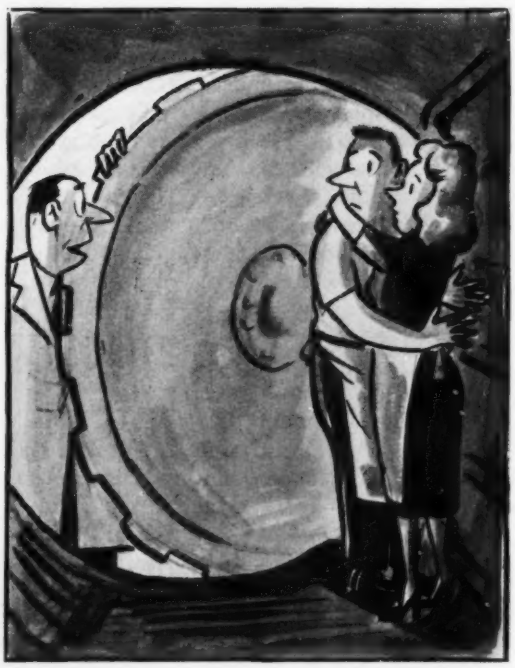
●**United States**—The Goodyear Tyre and Rubber Co. reports that sales in the first quarter of 1959 reached 370,572,209 dollars against 308,279,703 in the same period of 1958 producing profit equal to 1.57 dollars per share against one dollar. Sales were the highest for any quarter in the firm's history.

●**Poland**—A recent protocol to the 1949 trade agreement between Poland and Iceland provides for the supply to the latter country of rubber footwear and various plastics articles.

●**Argentina**—New regulations issued here recently simplify import regulations covering a large number of articles by removing the complex system of customs bonds which henceforth will be applied only to luxuries, non-essentials and automobiles. Rubber is included in the list of articles which can be imported without any surcharge. Regulations covering the import of automobiles are unchanged, with imports subject to a varying tax (a sliding scale which penalizes luxury models) plus a 500% customs bond.

●**Persia**—Construction of a modern tyre and tube plant in Teheran, Persia, has been started by B. F. Goodrich, Iran, SA, a newly-organized subsidiary of the B. F. Goodrich Co. Completion of the plant is scheduled for early 1961, according to Mr W. C. Gulick, president of International B. F. Goodrich Co. A group of prominent Persian investors is associated with B. F. Goodrich in the new company.

●**Indonesia**—The Bank of Indonesia's report for the last quarter of 1958 says the outlook for Indonesian rubber at the beginning of 1959 was encouraging. This was due to expected demand from the Soviet Union and indications that China would shift its purchases from Malaya to Indonesia. Russia recently announced she would buy at least 14,000 tons of Indonesian rubber this year and China had also signed contracts.



●**Sweden** — Sweden could become the biggest export customer of the International Synthetic Rubber Co., of Southampton. This was stated at a Press conference in Stockholm by Mr H. J. Hornsby, the company sales manager, who is currently visiting prospective customers in Sweden. Of the company's yearly production of 70,000 tons, 50,000 tons went to the United Kingdom market, the rest being exported mainly to Commonwealth countries and to Scandinavia.

'You're sacked! You, Podbury, that is'—439

Factice-Compensated Acceleration of SBR

By C. FALCONER FLINT, Ph.D., D.I.C., B.Sc., A.R.C.S., F.R.I.C., F.I.R.I.

(Continued from May 9 issue, page 702)

SUMMARY

After preliminary experiments, a detailed compounding study based on a type of 1502 SBR loaded with HAF black and accelerated with CBS (cyclohexyl benzthiazyl sulphenamide), has been carried out. It has been demonstrated that economies in SBR compounding can be effected by reducing the acceleration by 40% or more, compensating the adverse effects of this reduction by addition to the compound of a small (e.g. 5 phr) proportion of a low grade vulcanized fatty oil of an appropriate 'factice' type. This factice addition, without change in the time of cure given, is shown to maintain some properties (e.g. tensile and abrasion resistance) at the value observed before acceleration is reduced, actually to improve other properties (e.g. compression set, tearing energy, resilience and resistance to cut growth) and to be without adverse effect upon oven ageing characteristics. It is pointed out that the cost of the factic added need not be set off against the saving in accelerator cost because in the case of most SBR compounds, the volume cost of the factice added is actually less than that of the compound to which it is to be added, so that the factice actually cheapens the mix. Thus, the whole of the saving on acceleration is substantial and not merely apparent. In addition, the small addition of factice imparts valuable improvements to the processing properties of the compound, greatly enhancing (a) safety from scorch, (b) resistance to collapse after shaping, (c) docility to processing and shaping, and (d) extrusion rate and extrudate quality. This small addition of factice also promotes cool running on the mill and brings about a noticeable reduction in the time required for incorporation of the black. The term 'factice-compensated acceleration' is suggested, and systematic procedure for applying this principle to SBR compounding is discussed.

Simple MBT Compound Examined

Particulars of the mixings of this SBR compound examined will be found in Table 4. The same base formulation was used with high (1.5) and low (0.5) acceleration, in the absence and presence of factice (5 phr). Four factice types were investigated.

First of all, the optimum cure time of the high-accelerator-no-factice mixing was determined at 141°C., as this mixing was to serve as control, and the other mixings were to be examined at this time of cure. Application of a wide range of extension and compression tests (*cf.* Flint and Donnelly, *RJIP*, November 8 1958), fixed optimum cure for the control at 22 minutes at 141°C. for 2mm. test sheets (see Table 6).

TABLE 4
MBT/GPF/SBR compound
Analyses of factices used

	Parts by weight
SBR (low-temperature polymer type 1502)	100
Stearic acid	2
Zinc oxide	5
GPF black	50
Processing aid ('amended oil residues')	5
MBT accelerator	0.5 or 1.5
Sulphur	2
Factice	0 or 5

Addition Effects with four Factice Types in MBT Compound

The test results obtained for the 22 minute cures on the high accelerator mixings are given in Table 5.

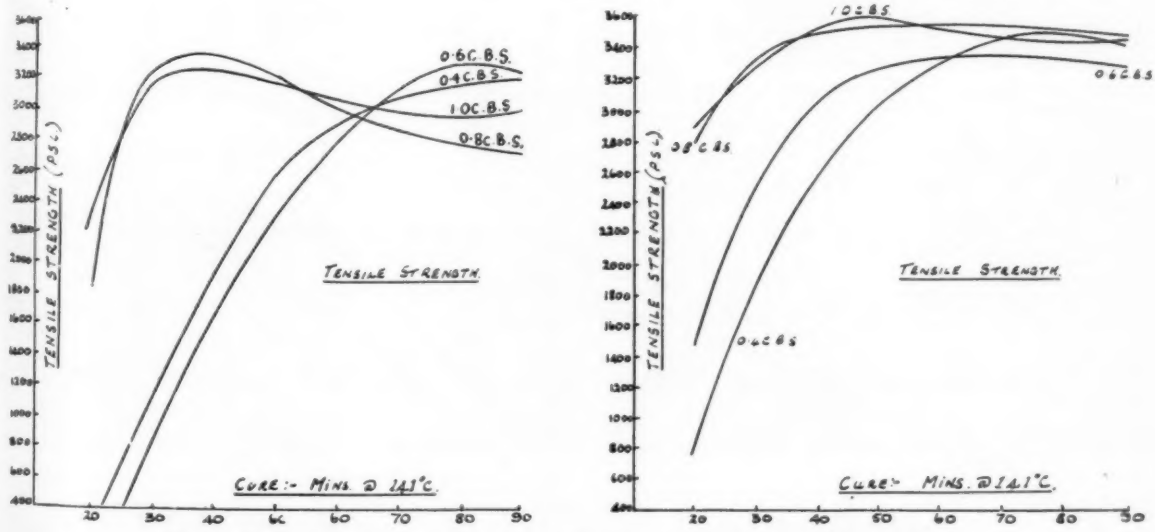


Fig. 1. Tensile strength. *left*, **no factice present ;** *right*, **addition of 5% RO1 factice**

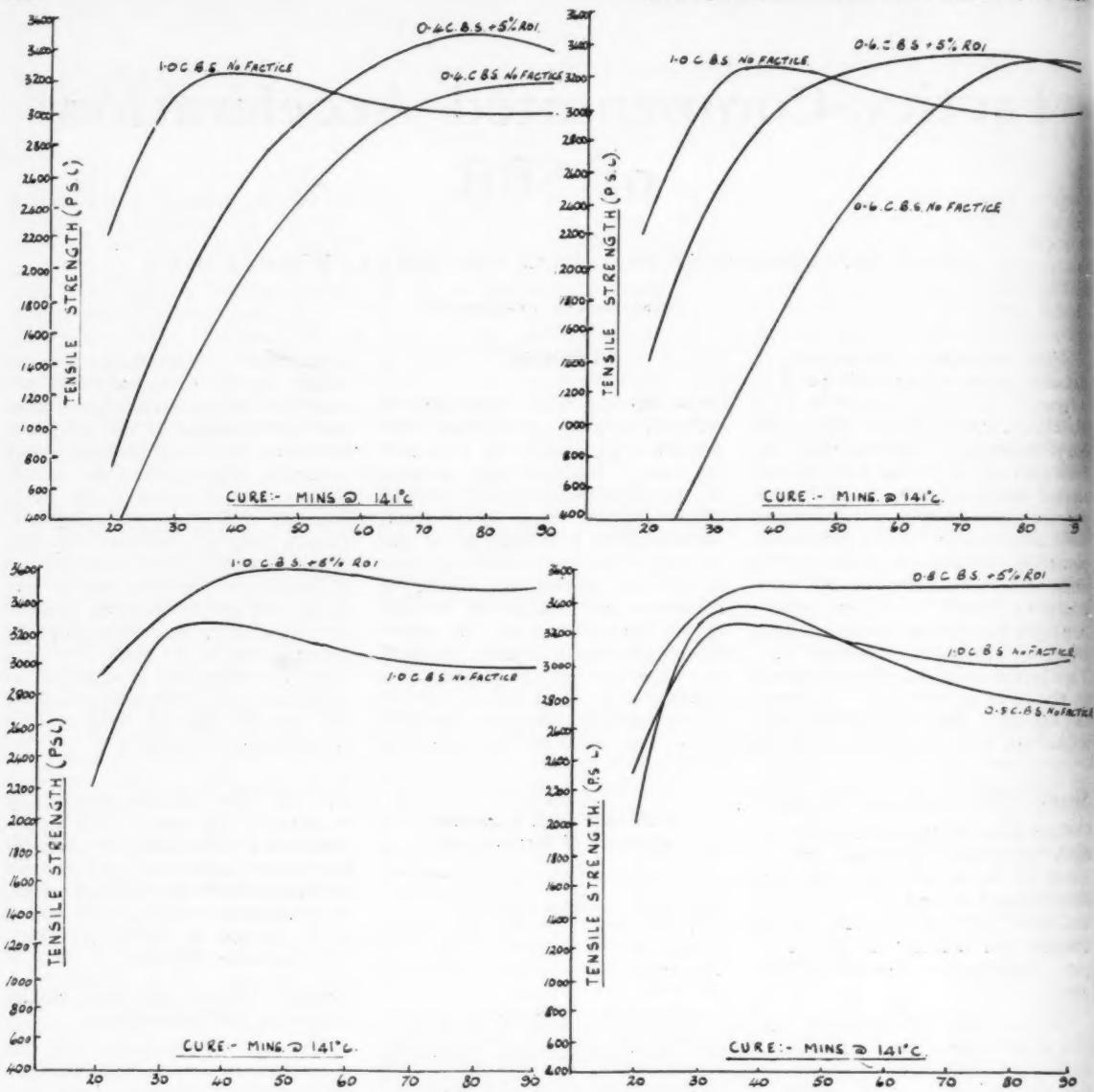

1·0 C.B.S. No Factice
0·4 C.B.S. + 5% RO1
0·4 C.B.S. No Factice
TENSILE STRENGTH (P.S.I.)
CURE:- MINS @ 141°C.
1·0 C.B.S. No Factice
0·6 C.B.S. + 5% RO1
0·6 C.B.S. No Factice
TENSILE STRENGTH (P.S.I.)
CURE:- MINS @ 141°C.
1·0 C.B.S. + 5% RO1
1·0 C.B.S. No Factice
TENSILE STRENGTH (PSI)
CURE:- MINS @ 141°C.
0·8 C.B.S. + 5% RO1
1·0 C.B.S. No Factice
0·8 C.B.S. No Factice
TENSILE STRENGTH (P.S.I.)
CURE:- MINS @ 141°C

Fig. 2. Tensile strength

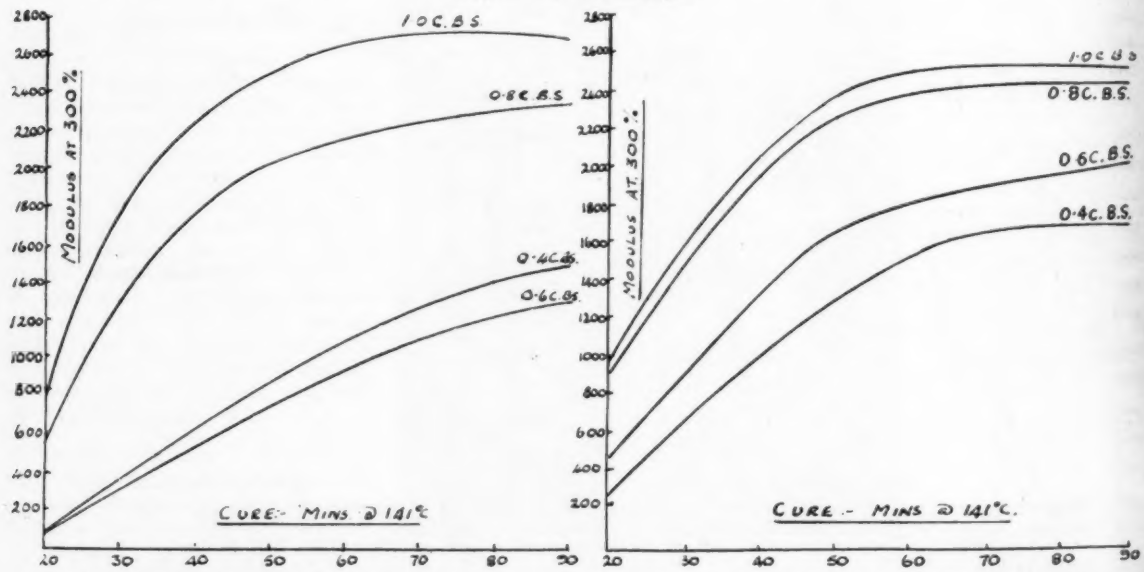
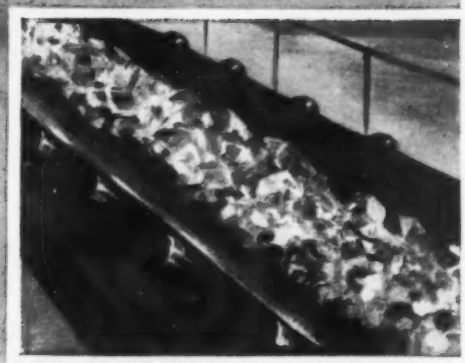


Fig. 3. Modulus at 300% elongation. *left*, **no factice present ;** *right*, **addition of 5% RO1 factice**

Nonox ZA



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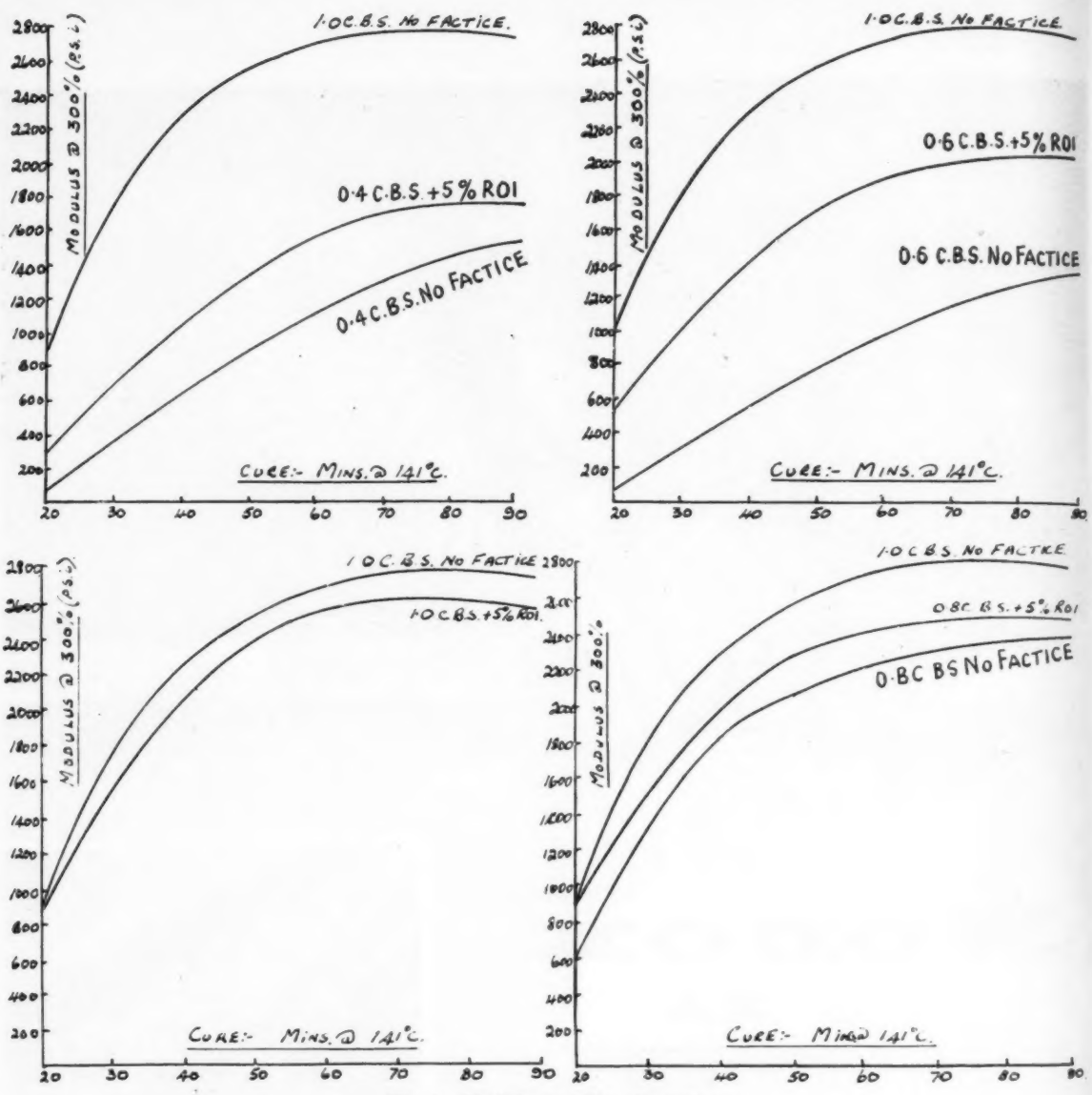

1·0 C.B.S. NO FACTICE.
0·4 C.B.S. +5% RO1
0·4 C.B.S. NO FACTICE
MODULUS @ 300% (P.S.I.)
CURE:- MINS. @ 141°C.
1·0 C.B.S. NO FACTICE
0·6 C.B.S. +5% RO1
0·6 C.B.S. NO FACTICE
1·0 C.B.S. NO FACTICE
1·0 C.B.S. +5% RO1
0·8 C.B.S. +5% RO1
0·8 C.B.S. NO FACTICE

Fig. 4. Modulus at 300% elongation

The effect on the high accelerator compound of the factice additions, was for the same cure time, to increase tensile (RO1 and RO3 best), to increase modulus (RO1 and RO3 best), with a barely significant trend to reduction of elongation at break. The factices converted to a decrease of satisfactory magnitude the tensile increase observed after the oven ageing of the control. The RO factices slightly reduced aged modulus stiffening, while the GO factices showed the opposite tendency. There was some tendency for the factices to favour shortening of the aged elongation, save in the case of RO3 where the decrease was barely significant.

TABLE 5

High (1.5) MBT/GPF/SBR compound: Effect of 5 phr factice. All cures 22′ at 141°C., which is optimum for the control compound (no factice)

Factice type added (5 phr)	Tensile			Modulus 300% Elongation			Elongation			Comp. set*
	BA	AA	% ret.	BA	AA	% ret.	BA	AA	% ret.	%
Blank (no factice)	1,922	2,197	115	826	1,622	196	725	418	58	5.5
RO1	2,240	2,027	90	1,055	1,931	183	687	318	46	3.4
RO3	2,215	2,085	94	1,078	1,838	171	655	356	54	2.1
GO1	2,190	2,010	92	916	2,010	220	681	300	44	3.9
GO2	1,982	1,906	96	876	1,784	227	756	331	44	3.2

BA = Before ageing AA = After 7 days air oven at 70°C.

* Twenty-four hours at 20°C. under 30% deflection, between glass paper surfaces, 1 hour recovery at 20°C., expressed as a percentage of the uncompressed (original) height.

Compression set was substantially reduced in comparison with the control, in all the factice compounds, type RO3 proving outstandingly advantageous in this respect.

On the whole, the most useful of the factice types for addition to this SBR compound would appear to be RO3. An addition to the high accelerator (1.5) compound of only 5 phr, without changing the time of cure, would appear to result in improvements in modulus, tensile and compression set properties.

Optimum Cure Determination on MBT Compound

The method of determining the optimum cure at 141°C. of the high (1.5) accelerator control (no factice) SBR compound is indicated in some

detail in Table 6. It will be appreciated that as four out of the six tests considered were carried out in compression and bear a more direct application to service conditions than the two remaining extension tests, the average time used has deliberately been loaded in favour of these more practical tests.

It should also be noticed that in the case of the compression tests, the cure curves were accurately plotted from many cures spaced at unusually small (2′) intervals.

TABLE 6

Determination of optimum cure at 141°C. of 1.5 MBT/GPF/SBR control compound (no factice)

Property measured	Inflection point of cure-time curve	Cure intervals for which tests were performed and plotted
Short CL compression set ..	22′	2′
Short CL creep	22′	2′
Relaxed compression set ..	18′	2′
Compression set (CD) ..	20′	2′
Tensile strength	25′	10′
300% Modulus	25′	10′
Average ..	22′	

Notes on tests carried out at 2′ cure-time intervals (using lubricated polished platens), Nos. 1 and 2, with Yerzley instrument:

1. Short CL compression set—constant load 100 psi for 2′ at 20°C., recovery 5′ at 20°C.
2. Short CL creep—constant load 100 psi for 2′ at 20°C.
3. Relaxed compression set—see Falconer, Flint and Donnelly, *RJIP*, Nov. 1958, p. 728 and fig. 18, p. 732.
4. Compression set (CD)—24 hours at 30% constant deflection (glass paper covered surfaces used in this case), 1 hour recovery, all at 20°C.

Compensation Effects with four factice types in MBT Compound

The physical test results, before and after a period of oven ageing, obtained, without change in time of cure, by reducing the acceleration (to 0.5) of this SBR mixing (see Table 4) and adding 5 phr of the four factice types, will be found set out in Table 7. For comparison, the values obtained for the control (high accelerator, no factice) and for the blank (low accelerator no factice) are also given in the table.

reduces modulus to less than a sixth of its former value, increasing considerably the elongation at break. In general terms, a 5 phr addition of factice to the low accelerator compound appears to maintain the original tensile value (almost completely in the case of RO3), to reduce quite substantially the loss in modulus (RO3 is again best), and to reduce somewhat the gain in elongation at break.

In the presence of factice, the period of oven ageing still further increased the high values of the unaged tensiles, and reduced considerably the stiffening of the blank modulus to an order not greatly different from that of the control on oven ageing.

It would appear, then, that in this

TABLE 7

Low MBT (0.5)/GPF/SBR compound: Effect of 5 phr factice. All cures 22′ at 141°C. (this is optimum for the high (1.5) MBT blank)

Factice added (5 phr)	Tensile (psi) BA	Tensile (psi) AA	Tensile (psi) % ret.	300% Modulus (psi) BA	300% Modulus (psi) AA	300% Modulus (psi) % ret.	Elongation at break % BA	Elongation at break % AA	Elongation at break % ret.
Control (1.5 MBT) —no factice ..	2,040	1,957	96	868	1,421	164	662	487	73
Blank — No factice (0.5 MBT) ..	661	2,260	342	139	754	542	1,050	737	70
RO1 (0.5 MBT) ..	1,842	2,360	128	409	940	230	925	662	72
RO3 (0.5 MBT) ..	2,025	2,500	124	489	1,010	203	937	662	71
GO1 (0.5 MBT) ..	1,662	2,230	134	450	989	220	912	700	77
GO2 (0.5 MBT) ..	1,982	2,310	116	488	1,062	218	912	662	73

BA = Before ageing AA = After ageing 7 days in an air oven at 70°C.

It will be observed from Table 7 that this reduction of the acceleration by 66% brings down the tensile to about a third of its former value and MBT accelerated SBR compound, a drastic reduction (for example, 66%) in the acceleration can be compensated to quite an important extent

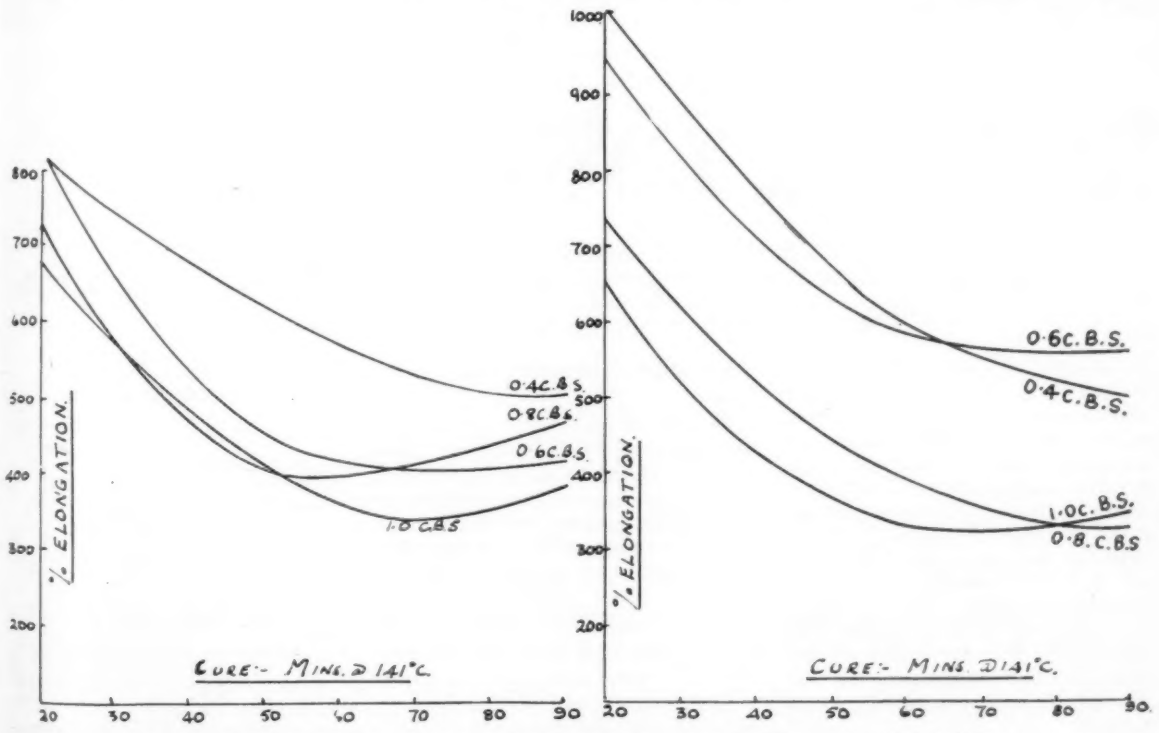


Fig. 5. Elongation at break. *left*, **no factice present ;** *right*, **addition of 5% RO1 factice**

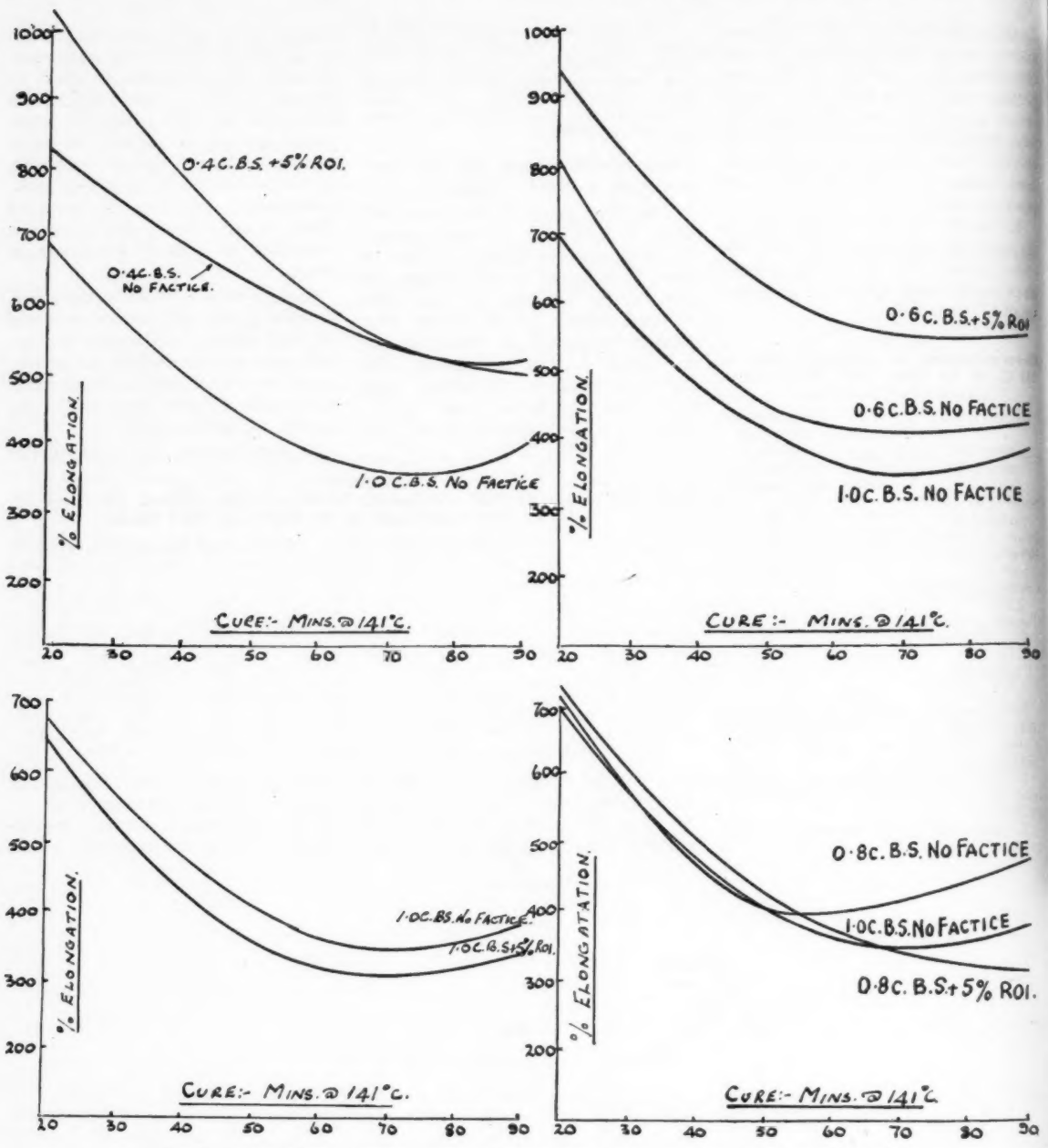


Fig. 6. Elongation at break. **a,** *below left.* **b,** *below right.* **c,** *above right.* **d,** *above left*

by addition of 5 phr of RO3 factice, without need to change the time of cure from that giving optimum cure in the high accelerator mixing. In comparison with the control, the compensated vulcanizate is as strong in terms of tensile, and appears to age better (as judged by tensile retention). Although the compensated vulcanizate is of lower modulus and greater elongation at break than the control, the change in these properties with oven ageing does not appear to suggest that this formulation has any adverse effect on the ageing characteristics.

Sulphenamide-accelerated Compound Studied

After these preliminary indications of interesting possibilities it was thought valuable to undertake a detailed study based on the acceleration of an SBR compound with a popular and widely used sulphenamide accelerator, using as filler a higher grade of black (HAF instead of GPF).

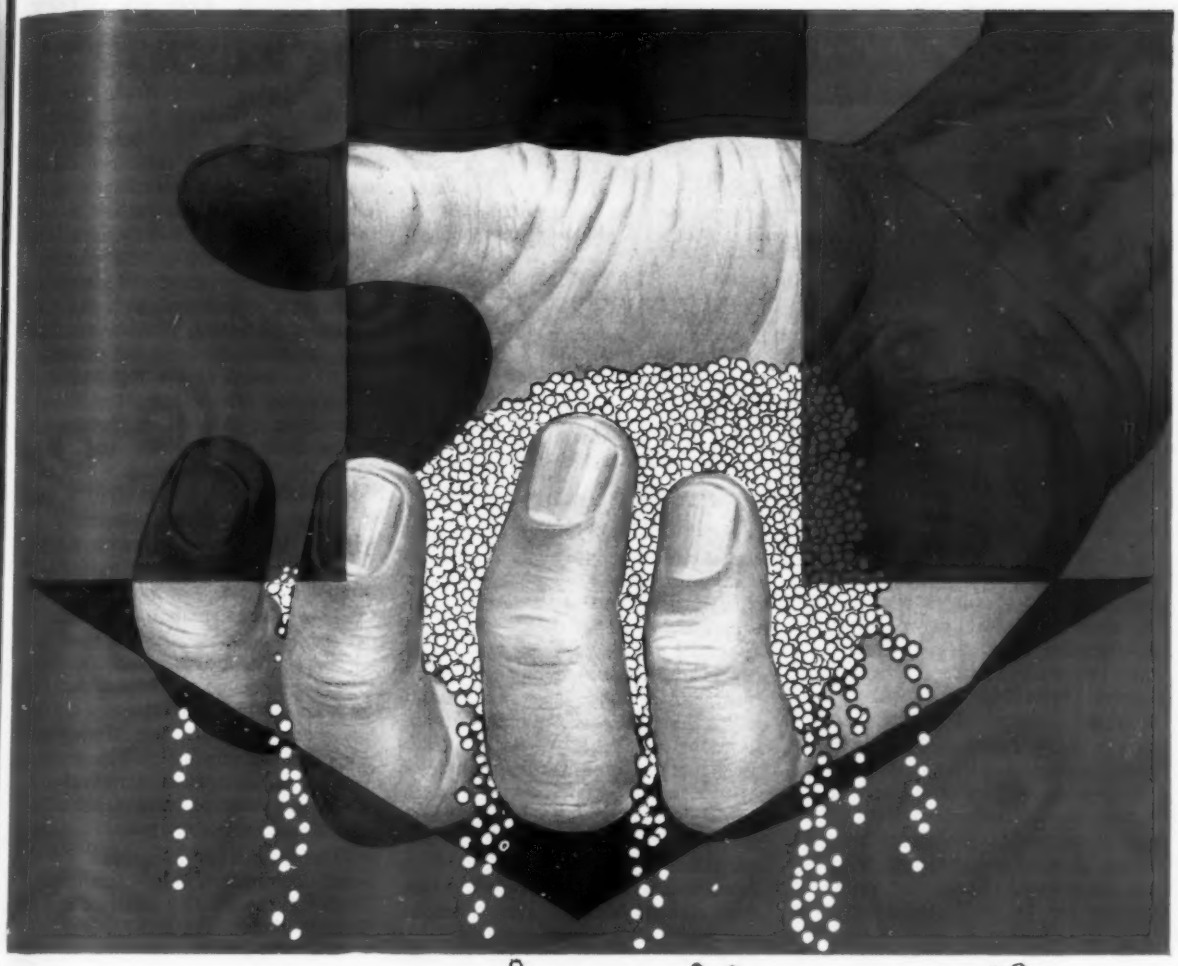
The compound used is given in Table 8.

The mixings as described below, based on this CBS compound (Table 8) were prepared on an open mill of which the roll surface temperature was maintained at 80°C. by thermo-

TABLE 8
CBS/HAF/SBR compound

	Parts by weight
SBR (low-temperature polymer type 1502)	100
Stearic acid	2
Zinc oxide	5
HAF black	50
Processing aid ('amended oil residues')	5
Sulphur	2
CBS accelerator*	As stated
Factice	0 or 5

* Cyclohexyl-benzthiazyl-sulphenamide.



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statically controlled oil circulation, (Flint, Featherstone and Donnelly, *Trans. IRI*, 1957, *33*, p. 198, Fig. 1).

Detailed Cure-time Study of Factice-compensated Sulphenamide Reductions

First of all, the accelerator content was reduced in steps—1.0, 0.8, 0.6, 0.4 — and extension data (tensile, 300% modulus and elongation at break) were plotted against times of cure for compounds with and without 5 phr of the factice RO1. In this way, families of curves were plotted to show the effect of reducing the acceleration of this compound with and without factice. From these curves (Figs. 1 to 6) it will be seen that 40 minutes at 141°C. is evidently the optimum cure for the high-accelerator-no-factice (the control) compound, and that it would be interesting to compare with the physical properties of this optimum cure, those of a 40 minute cure from the the compound containing only 0.6 accelerator (a 40% reduction) but with the addition of 5 phr of the RO1 factice. This comparison has been made in Table 9.

Sulphenamide Compound: Factice Addition Effects

Noting first the effect of an addition of 5 phr to the high accelerator compound (1.0 CBS), a small but significant improvement in tensile is seen accompanied by a negligible fall in modulus. Elongation at break is hardly affected significantly, and there is only a very slight fall in hardness.

Sulphenamide Compound: Factice Compensation Effects

When the acceleration is reduced by 40% (1.0 becomes 0.6), tensile strength falls in the absence of factice, but an addition of 5 phr maintains tensile almost completely. The low acceleration reduces modulus to less than 25% of its high accelerator value, and while the factice addition does not correct this completely, it helps much. It should here be noted (from Table 12) that *compression* modulus, which is a much more significant service property, appears to be fully maintained when factice is used to compensate a reduction in acceleration. Low accelerator increases the elongation at break, but the addition of factice goes far to offset this increase, also restoring all but 4 points of the 12 point loss in hardness.

TABLE 9

High and low CBS/HAF/SBR compound: Effect of 5 phr RO1 factice. All cures 40′ at 141°C.

Test applied	No factice		With 5 phr RO1 factice	
	Low accelerator (0.6 CBS)	High accelerator (1.0 CBS)	Low accelerator (0.6 CBS)	High accelerator (1.0 CBS)
Tensile strength (psi)	1,695	3,240	3,165	3,570
Modulus at 300% (psi) ..	508	2,347	1,483	2,192
Elongation at break (%) ..	800	425	550	475
Hardness °BS	55	67	63	65

(To be concluded)

Pirelli Appointment

Mr W. A. Frizell has been appointed home replacement manager of Pirelli Ltd. This post has been created within the tyre sales organization and is under the direct control of the chief executive, tyre sales, Mr H. A. Parson. The new department in the tyre sales organization will function from Pirelli House, London, and all divisional sales managers will now be responsible to Mr Frizell.

Mr Frizell was born in Darlington and joined Pirelli Ltd. as the Birmingham office manager in 1937. In April last year he was presented with the company's 21 years' service award. In his new capacity, Mr Frizell will continue to act as assistant to the chief executive tyre sales.

A new Dunlop road map showing the approximate width of roads in south-east England is now on sale at bookstalls and shops, price 5s. It has been designed to enable the motorist to plan his route along the widest roads available or select the best alternative route at weekends or holiday periods. The scale is five miles to the inch.

WELDING OF PLASTICS

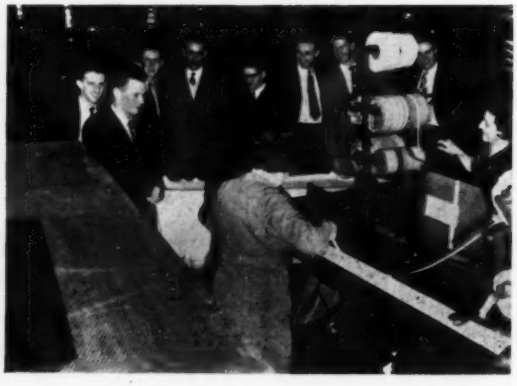
A ten-day full-time course on the welding of plastics will be held in the Plastics Laboratories of the Borough Polytechnic, Borough Road, London, S.E.1, from June 29 to July 10 1959. It is intended for technical college teachers and others who may be called upon to provide instruction in the welding of thermoplastic materials in, for example, building and plumbing courses. The aims of the course are to become acquainted with the wide range of different plastics materials and the usual methods for processing them; to learn of the importance of the welding process for thermoplastics in relation to these other processes; to study, both theoretically and practically, the modern techniques now used for welding and heat-sealing a wide range of thermoplastics materials.

The 19 lectures deal with the following aspects: General introduction to plastics; the processing and manipulation of plastics; the technology of weldable plastics; the thermal and electrical properties of the weldable plastics; welding of thermoplastics by heat transfer; high frequency welding of thermoplastics; the testing and identification of plastics. The practical course will consist of demonstrations and supervised practical work. The fee is £2 10s.

The course is sponsored by the joint committee, the Institute of Welding, the Plastics Institute and the British Plastics Federation.

The Plastics Institute hope to stage an exhibition during the above course. Any manufacturers interested in providing equipment or materials are requested to get in touch with Mr J. E. Proctor, M.Sc., A.R.I.C., at the Borough Polytechnic, Borough Road, London, S.E.1.

Mr Neville Bertram has been appointed a director of Dunlop Rhodesia Ltd.



A group of students from the National College of Rubber Technology, who recently made a study tour of Italy, visited the Milan - Bicocca plant of Pirelli. They showed particular interest in the company's physics and chemistry laboratories

NR Price and US Stockpile

SALES FROM STOCK URGED

HIGH prices of natural rubber are contributing to inflation in the United States and are injuring the rubber plantation industry abroad, Mr J. W. Keener, president of the B. F. Goodrich Company, said in Akron.

Commenting on the fact that natural rubber prices are at their highest level in more than two years, Mr Keener said the US Government should 'give immediate attention' to the sale of natural rubber from the nation's huge stockpile.

800 Million Dollars

'The present stockpile, accumulated before and during the Korean War, is estimated to have cost about 800 million dollars,' Mr Keener said. He pointed out that the total tonnage has not been reduced 'even though the Government has reported changes in national defence planning that would lower crude rubber requirements in the event of war.'

He said that high prices for natural rubber are 'decidedly injurious to the plantation industry, because such high prices stimulate an increase in the use of man-made rubber throughout the world.'

There is no question, Mr Keener said, that the synthetic rubber industry has the capacity to supply a greater share of the total world rubber requirements. The US has facilities capable of producing more rubber than the nation is using, and a number of new plants have been built in foreign countries, he said.

Replacement Stopped

It is reported that the House Appropriations Committee in Washington has ordered the administration to stop replacing stockpile materials it must rotate to prevent deterioration. This would affect such perishables as rubber, fibres and oils.

The general services administration had told the committee it would have to sell some 43 million dollars worth of these commodities during the fiscal year starting July 1, and it would cost 49.4m. dollars to replace these commodities. The house committee said it would expect GSA to sell off these deteriorating commodities, but refused to allow the funds to re-purchase the rotated materials.

Informed trade sources said this would mean that if carried out to its logical conclusion the GSA, which has been buying higher grade ribbed sheets such as number one grades for the stockpile and selling the lower grade ribbed sheets and offgrade rubber, would be expected to sell the offgrade rubber, but not purchase the higher grade natural.

The total inventory of raw materials in various Government stockpiles on December 31 1958 was 8,000m. dollars, the committee said, adding that 4,200m. dollars of this was in excess of the stockpile objectives.

Plastics Lifeboat

GERMAN DEVELOPMENT

A PLASTICS ships' lifeboat that is completely enclosed for maximum protection of its occupants, and which will right itself automatically from any position, has been developed in Germany. It may be quickly entered through four large hatchways that can be hermetically sealed to make the lifeboat completely watertight. Plastic domes at both bow and stern provide visibility so that a lookout can be maintained. The structure consists of a double hull of tough, glass fibre reinforced polyester, supplied by Reichhold Chemie AG, Hamburg. Space between the two polyester layers is filled with hard polyvinyl chloride foam. Overall length of the craft is approximately 26ft. The interior compartment, which seats 40 and can hold considerably more in emergency situations, is 20ft. 6in. long, 9ft. 6in. wide and 4ft. 11in. high.

The advantages of this new design from a life-saving point of view are self evident. Being of plastics construction its weight compares favourably, foot for foot, with that of more conventional types of lifeboat which are normally made of steel. Forerunners made of plastics materials have been open topped. The boat is diesel powered, equipped with radio, floating anchor, complete survival equipment and other necessary gear.

UAM Group

The UAM Group announces that its associate company in Uganda, the Universal Asbestos Manufacturing Co. (East Africa) Ltd., has acquired a financial interest in Universal Plastics Ltd., Nairobi, which is now producing translucent plastics sheeting for rooflights and other purposes.

Joint marketing arrangements for the Group's asbestos cement and plastics products have proved satisfactory in the UK, and it is anticipated that similar facilities in the East African territories will also be beneficial.

The new German lifeboat—completely enclosed and made from polyester resin

New Porous Plastic

CONTROLLED PERMEABILITY HD POLYTHENE

A NEW permeable material of medium pore size with a wide range of potential uses is being manufactured by Pritchett and Gold and EPS Co. Ltd., of Dagenham, Essex. Produced from high density polyethylene of the Ziegler type, the new material, Vyon, has already found considerable applications in air and liquid filtration, air fluidized powder conveying, and as aeration pads and electrolytic diaphragms.

Various forms of porous Vyon sheet and fabrications, illustrating continuous strip small and large tubes and a simple cone

For use in liquid filtration, Vyon has a number of advantages including complete freedom from detachable fibres and a smooth surface that makes for easy cleaning. Its inherent strength enables it to be used unsupported if so required. One of the most notable features of the material, especially in connexion with air fluidized powder conveying, is the exceptional uniformity of air distribution.

Important uses have been found for the material in the field of surgery for the making up, for instance, of flail arms for paralysed patients and for orthopaedic splints. Firm, light and flexible support is provided and air can reach the skin. Less spectacular uses include flower pots and ink pads.

Vyon, which can be coloured, is available in sheets up to 32 x 32 in. and from 0.03 in. to 0.2 in. in thickness. The sheets have considerable strength and can be readily formed and welded. Maximum permeability is stated to be in the region of 50 cu. ft. of air/sq. ft./min. at 0.25 psi for sheet of ⅛in. thickness.

A more rigid porous material, made from polyvinyl copolymers, is manufactured by the company under the name Vyon 1.

Canadian Asbestos

Shipments of asbestos from Canadian mines in March jumped 26.6% to 69,902 tons from 56,178 a year earlier, the Bureau of Statistics reports. Shipments for the first quarter were up 10.8% at 184,689 tons, compared to 166,577 a year ago.

Mr Thomas H. Miller has been appointed to the Boards of the Sabrang Rubber Estate, the Badenoch Rubber Estate and the Straits Rubber Company.

IRI Golfing Society

MANCHESTER SECTION

THE Manchester Section of the IRI Golfing Society held its qualifying round for the Wallwork Cup at Sandiway Golf Club on April 27. Despite frequent heavy showers in the morning, the weather cleared early in the afternoon, when 38 members teed off in an effort to qualify. This gives the Manchester Section 13 qualifiers for Hawkstone Park, where the Wallwork Cup Week-end is to be held this year.

Some very good scores were returned, bringing one or two new names into the list of qualifiers. A. W. Ayres turned in a 71 nett, and G. Betts a 72 nett score, and of course, B. J. Newey not far behind with a 73 nett score. Prizes were generously contributed, and we have to thank the following members for them: T. A. Wilson, British Recovered Rubber and Chemical Co. Ltd.; S. Heywood, Alfred Smith Ltd.; H. West, West and Senior Ltd.; G. Betts, Joseph Anderson and Sons Ltd.; A. Tonge, J. Mandleberg and Co. Ltd.; J. H. Carrington, Anchor Chemical Co. Ltd.; E. Cheetham, Whitehead Chemical Co. Ltd.; T. R. Waring, Imperial Chemical Industries Ltd.; F. W. Williams, Shell Chemical Co. Ltd.

—G. C. S.

The scores of the qualifiers are as follows:

	Gross	*H'cap*	*Nett*
A. W. Ayres ..	89	18	71
G. Betts	90	18	72
B. J. Newey	78	5	73
E. Cheetham ..	89	13	76
S. Heywood	86	9	77
H. G. Redfern ..	89	12	77
A. Lord	94	17	77
B. Wallace	95	18	77
A. F. Sanders ..	98	18	80
J. Halstead	99	18	81
H. K. Mills	87	5	82
R. N. Ferguson ..	94	12	82
J. L. Ferguson ..	94	11	83
H. West	97	14	83
Reserves:			
A. Tonge	94	10	84
W. A. Kenyon ..	102	18	84
S. T. Diggle ..	87	3	84

New API and FPI Regulations

The Council of the Plastics Institute has included in its revised Regulations for the Associateship (A.P.I.) a new route without examination open to candidates holding suitable qualifications in appropriate basic subjects, who have acquired knowledge of plastics technology and science as a result of satisfactory experience in the plastics industry.

Electrical Aids in Industry *Data Sheet* **No. 5**

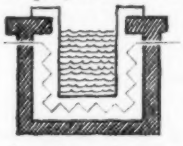
Resistance Heating – 2

Electric resistance heating elements have been briefly described in Data Sheet No. 4, with two examples of their application in industry. This sheet lists some of the further applications which can be effectively dealt with by resistance heating.

Soft Metal Melting

Electric resistance melting is most commonly used for lead, tin, zinc, antimony, aluminium and their alloys—in processes such as tinning, type-casting, die-casting and lining bearings—at temperatures of up to around 800°C.

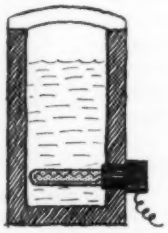
In most cases, sheathed elements are immersed directly in the metal, a more efficient method than applying heat to the outside of the containing vessel or pot. Immersion heating simplifies the application of lagging to the outside of the vessel, reducing heat losses and current consumption to a minimum. The elements are usually positioned near the inside wall of the vessel, leaving plenty of working space, but in a few cases, where the full volume of the pot is required, or where the metal to be melted is particularly corrosive, the elements are positioned outside the pot, often in contact with it.



In all cases, the precise temperature control that is so essential in soft metal processes is readily achieved by the use of electricity, and electric heating also leads to a reduction of casting rejects and metal wastage and a marked improvement in working conditions.

Liquid Heating

Electricity provides the ideal way of heating liquids such as water, oils, varnishes, plating, photographic and other solutions, and of melting and heating waxes and compounds, glues and pastes, tars and bitumen. Again, immersion heating is the method most commonly employed, but considerations of space or the nature of the liquid may sometimes necessitate the use of external heaters. Several types of devices are available to give precise and automatic temperature control, and lagging is again commonly applied to the vessel to minimise heat losses.

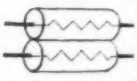


Fire hazards associated with inflammable liquids are invariably reduced by electric heating, particularly if immersion heaters can be used.

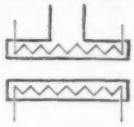
It is usually possible without difficulty to apply electric heaters, either immersion or external, to existing vessels.

Platen, Press and Roll Heating

Electricity offers the simplest and most convenient method of heating platens, dies and rolls. It gives the precise temperature-control characteristic of electric heating systems, with lower maintenance costs. Moreover, the relatively high temperatures required in some processes for maximum working speeds are reached without difficulty. Flexible electrical connections to moving parts give far less trouble than flexible pipe connections carrying hot water or steam.

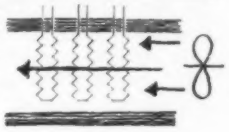


When electric heating is used, one or more presses can be operated without the necessity of keeping a boilerhouse staff at work.



Air Heating

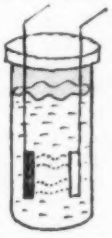
Streams of air, and of many other gases, can be heated most efficiently by electric resistance elements disposed across the duct leading to or from a fan. Heat is generated only inside the duct, just where it is required, and none is carried away through exhaust flues or pipes. Quick rise of temperature and precise temperature control are assured when electric resistance air heaters are used.



Electric Steam Boilers and Steam Raising

There are many cases when the use of electricity for steam raising is fully justified on economic grounds.

The means employed for bringing steam from a boilerhouse to the point of usage are often extremely wasteful, but where electricity is used the steam can be generated on the spot and losses from steam mains are eliminated. The efficiency of the electric boiler normally exceeds 96% and is practically constant at all loads, while the rapidity with which steam can be raised very largely eliminates banking losses.



Plant requiring process steam can be equipped with its own electric steam boiler, freeing the working space of steam mains just as individual electric motor drives free the factory of masses of shafting and belt drives.

Even where boilerhouse steam is still used, it is sometimes desirable for best results to boost the steam temperatures at the point of usage, to make up for transmission heat losses or to increase the superheat, and this function can most conveniently be performed by an electric resistance heater inserted in the steam line.

For further information get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, W.C.2. Telephone: TEM 9434.

Excellent reference books on electricity and productivity (8/6 each, or 9/- post free) are available – "Resistance Heating" is an example; "Induction and Dielectric Heating" is another.

E.D.A. also have available on free loan a series of films on the industrial use of electricity. Ask for a catalogue.

1816

Advertisers Announcement

VIEWS and REVIEWS

The Lampitt Medal

THE Society of Chemical Industry has instituted the Lampitt Medal in memory of the late Dr Leslie H. Lampitt, sometime President, Honorary Treasurer, and Honorary Foreign Secretary of the Society, and a member for 37 years (*Chemistry and Industry*, 1959, No. 12, p. 386).

The Medal is to be awarded for 'outstanding services to the Society through the Sections and Groups.' It is struck in gold and was designed by Mr T. H. Paget, who designed the Castner Medal and is a well-known medallist, 'much of whose work in coinage has been for the Royal Mint.' The Medal is to be awarded not more frequently than biennially, but at its inception Council have decided to make five awards, and the recipients and their qualifications are set out in the issue of *C and I* quoted.

Dr Lampitt's name and activities were well known to many of us, especially in connexion with the chemistry of food, and it may be remembered that he was a guest at the high table at the dinner given in connexion with the Institution of the Rubber Industry's *Foundation Lecture* in 1947. Dr Lampitt is much missed by those who knew him, and his death at an early age was a sad happening.

Cecil Henry Desch

The April 1959 issue of the *Proceedings* of the Chemical Society contains an obituary notice of Cecil Henry Desch, F.R.S., by Dr C. Sykes. 'This distinguished metallurgical scientist whose published work is known in all parts of the world,' as the writer of the obituary notice justly describes him, died in June 1958 at the age of 84.

To the writer of these notes, although neither a metallurgist nor having any special connexion with inorganic chemistry, Desch's name was (in the scientific sense) a 'household' word, so accustomed was one to seeing it in literature. Amongst his many distinguished positions and honours—fuller details will be found in the quoted obituary—it may be mentioned that, after occupying a number of important positions, Desch was, in 1931, appointed Superintendent of the Metallurgy Department of the National Physical Laboratory, Teddington, from which he retired in 1939. Subsequently he held several important posts in industry.

In the academic field, his chronicler mentions (*inter alia*), that he was elected a Fellow of the 'Royal' in 1923, and over the period 1926 to 1948 he had been President of the Faraday Society, President of the Institute of Metals, and President of the Iron and Steel Institute. The Bessemer Gold Medal was awarded him in 1938, and he was a corresponding member of the *Académie des Sciences*.

Advanced Materials Technology

I have recently received a copy of a publication (title as above) of the Carborundum Company of Niagara Falls, New York, USA (which has been forwarded by The Carborundum Co. Ltd., Trafford Park, Manchester 17). I give these particulars because the publication as described 'is of particular interest to those who need information about materials that withstand extreme heat, abrasive or corrosive action beyond the capabilities of conventional materials.' This description is certainly borne out, in my opinion, by the copy of the publication (*Vol. 1, No. 5*, December 1958) which seems to me not only to contain information of definite interest, but—so far as I am aware—to cover a field with which many of those interested in science and technology probably have little knowledge.

For example, the first article deals with 'Crystals that Bend.' On reading this I quite agree that 'The promise of ductility in a ceramic lends added emphasis to the many unique properties revealed in development work with magnesium oxide.' The illustrations which go with this article are certainly out of the common. Thus, that of a '*bent crystal* of clear, fused magnesium oxide, magnified 10X, demonstrates remarkable ductility,' is a most uncommon—as it seems to me—phenomenon, particularly as it is stated that the bending was performed at room temperature.

With regard to the implication of this material the article says:

'Generally, ceramics are associated with the hard, unyielding characteristics which represent the antithesis of ductility. The development of large, ductile magnesium oxide bodies could thus eliminate a major limiting factor, and point toward the employment of ceramics as substitutes for metals in many applications involving extremely high temperatures or other severe conditions.'

Bent crystal of clear, fused magnesium oxide, magnified 10X, demonstrates remarkable ductility. Bending was performed at room temperature. Acknowledgments to *Advanced Materials Technology*

The article on the bent crystals ends as follows:

'In many respects, fused magnesium oxide appears to offer qualities that make it the ultimate in refractories for a wide range of applications. The Carborundum Company will welcome inquiries which may help to give direction to future development work.' It is stated that 'This

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **DR SCHIDROWITZ**

publication is available without charge to all whose work demands materials ' of the character described above.

(Further information is available from Research and Development Division, Dept. AMT, The Carborundum Company, Niagara Falls, N.Y.)

Other articles in the issue of *Advanced Materials Technology* quoted above deal with ' " GRB " Silicon Carbide ' (Silicon Carbide Bonded Graphite); ' Zirconium Alloys '; ' Most Versatile Man-made Mineral,' and ' Problems in Materials Engineering.'

With regard to the ' most versatile mineral ' the description of this is ' Originally sold at $600 per lb. as a diamond polishing medium, silicon carbide now plays an expanding role in industry. Present applications give only a hint of its future potentialities.'

Eastern Reports

Amongst the publications which I have recently received are:

(a) ' The Annual Report of the Rubber Research Institute of Malaya 1955.' It may be remembered that the RRIM is gradually publishing reports delayed as a result of the war.

(b) The Combined 3rd and 4th Quarterly Circulars for 1958 (*Vol.* 34, *Parts* 3–4) of the Rubber Research Institute of Ceylon.

(c) The January 1959 issue of *Rubber India.*

All the above contain matter of interest, and, as and when the opportunity arises, I hope to be able to refer to them in greater detail.

Research and Efficiency

The *Planters' Bulletin* (of the Rubber Research Institute of Malaya) for March 1959 includes a useful ' Editorial on Research and Efficiency.'

This article should be read as a whole but in regard to a specific point the Editor says:

' To be more specific, cheap methods of planting and maintaining immature areas and their reverse, overcultivation and unbalanced manuring, are not efficient. Money spent on efficient supervision is seldom wasted. The question of the degree of supervision to be provided is individual. Small amounts of money saved in trivial ways may lead to the expenditure or loss of large sums after the passage of years.'

And in a later passage:

' We contend, therefore, that for the health of the rubber producing industry, routine methods should be regularly reviewed and that time should be deliberately allotted to examining efficiency in general on plantations. In other more mechanized industries, special consultants are available for this purpose.'

Rubber Reviews for 1958

As is, I believe, well known, the Division of Rubber Chemistry of the ACS publishes four regular issues of *Rubber Chemistry and Technology,* but it may not yet be quite so widely appreciated that *RC and T* now publishes annually, as a *fifth* issue, ' Rubber Reviews,' and that the latter ' constitutes the division of Rubber Chemistry's contribution to the summarization of knowledge of rubber chemistry and technology by experts in the field.' In view of the literary and technical importance of this new departure, it is not, it seems to me, irrelevant to mention that the Editorial Board of ' Rubber Reviews ' comprises N. Bekkedahl (National Bureau of Standards), G. S. Whitby (University of Akron), and well-known names of individuals representing or of Cabot, Goodyear, Goodrich and Firestone.

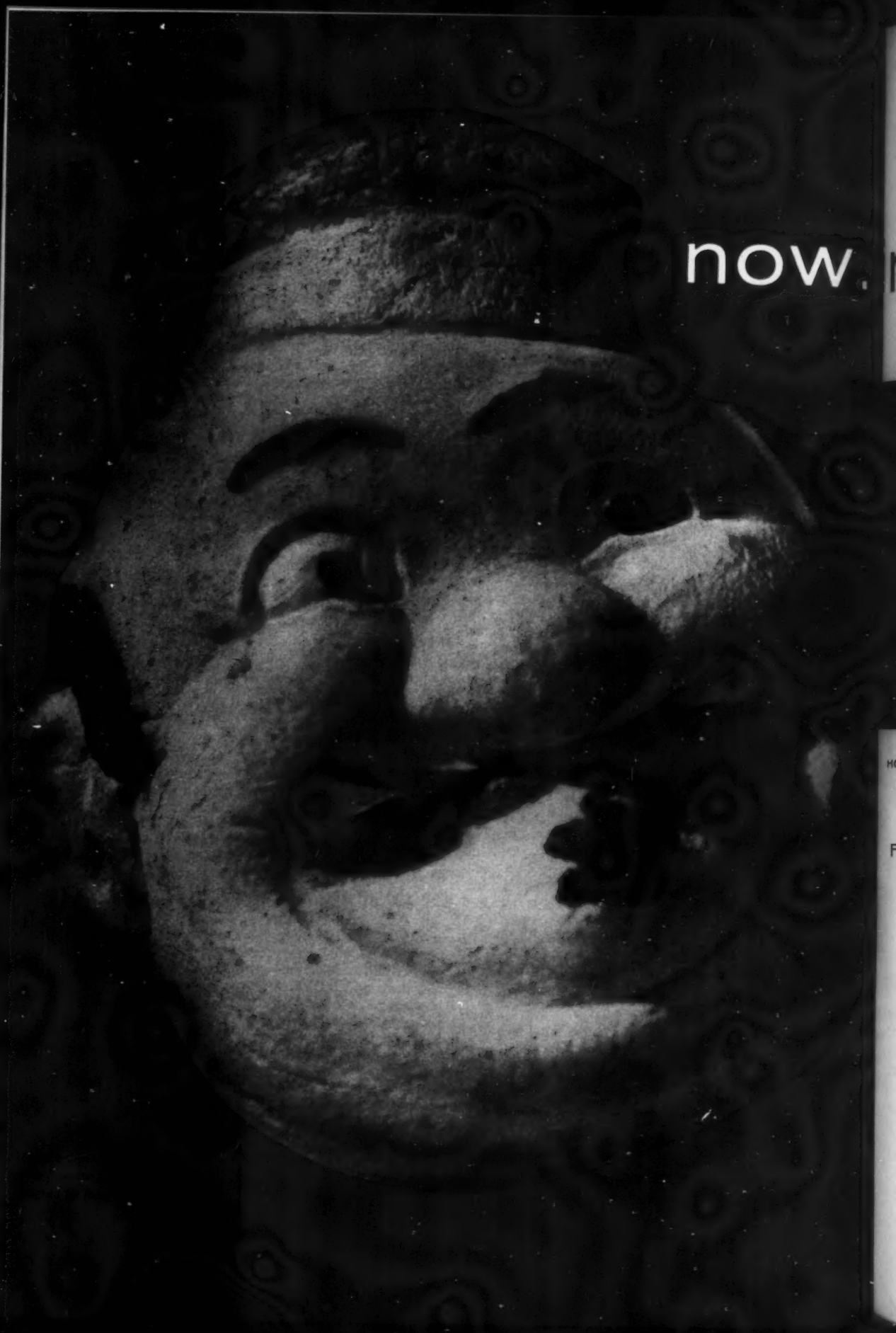
The latest issue of ' Rubber Reviews ' (for 1958) consisting of seven comprehensive papers, including one of some 60 pages, was issued in December 1958.

Notes

Amongst literature issued by Messrs Du Pont I note No. 2 of Vol. 1 of the new *Elastomer Review,* which covers information re some new neoprene types, and a neoprene latex (type 673) for contact adhesives. Then we have information re compounding neoprene for resistance to sunlight, ozone, and weather. *Hypalon* is featured in regard to solution coatings, and there is an article on ' Viton,' which is a ' new fluorocarbon elastomer for fluid and heat resistance.' Amongst its properties it is mentioned that ' Viton ' has ' Mechanical properties comparable to conventional elastomers, something heretofore unattainable with high temperature-resistant rubbers.' Those interested in neoprene and ' Hypalon ' should also consider the various issues of *Elastomer Notebook* (' The Language of Rubber,' parts XII, XIII and XIV, and BL-342 Report on *Hypalon Cellular Rubber.*

I have before me two issues of *Vanderbilt News* (Nos. 4 and 5 of Vol. 24), of which a review has, owing to accidental circumstances, been somewhat delayed. The first of these contains particulars relating to some of the Vanderbilt accelerators and compounding materials regarding which improvements and modifications have been made (*e.g.,* re ' Altax,' ' Amax,' ' Floform P-33 ' and ' Thermax '), and ' Darvan ' (Applications in High-solids Fluid Dispersions). The second issue noted commences with ' A News Report on Activities at the Yale Manufacturing Co.' (of Sandusky, Michigan), described as one of the successful producers in the Michigan-Indiana-Ohio territory group of companies. Activities are discussed under sub-headings such as ' SBR Compounding Trends,' ' Butyl Compound Design,' ' Butyl-to-Metal Bonding,' ' Oil and Grease Resistance Seals.' There is also a number of interesting illustrations. The issue also covers an article on a new Vanderbilt processing aid, and data on neoprene acceleration. Finally, there is an article on ' Nitrile Rubber. Heat Resistant Compounds of Graduated Hardness.'

PHILIP SCHIDROWITZ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Questions Corner—72

(Second Series)

307. What are the main considerations that should be made in the selection of an extruder for plastics?

308. Give brief details regarding polyvinyl carbazole.

309. Various analytical and viscosity methods are used in testing plastics. What are they?

310. A variety of polymerization methods in liquid solution are used industrially with vinyl-type monomers. Discuss these.

(Answers next week)

Answers to Questions Corner—71

303. There are several advantages to be obtained by using silicone resin protective coatings principally in their greater heat stability, weather resistance and durability. They are resistant to most chemical fumes, dilute and concentrated acids, dilute alkalis, salts and oils at moderate temperature.

Silicone paints have been produced for operating at temperatures up to 250°C. and yet maintaining their flexibility and colour. They are not very resistant to moist gases containing oxides of sulphur.

Aluminium pigmented silicone paints have been tested at temperatures up to 550°C. and the films found to be intact after exposure for more than 40 hours. Tap water, at room temperature, sprayed on to the coating during the test, had no effect (Paint, Oil and Chem. Rev., 1946, November 14 1946).

The moisture resistance of silicone paints is very good, as is their water repellancy, both properties being useful. Silicone paints will withstand severe weathering, but some care must be taken in the selection of suitable pigments and driers.

The resistance of silicone resins to aromatic hydrocarbons is not very good but, provided the film is properly cured, pigmented paints will give good solvent resistance because pigmented films are less readily attacked.

Adhesion of silicone resins is satisfactory to most metals, and while it is not so good with steels, sand blasting, or the use of a primer, will make it sufficiently good for most purposes.

304. An injection moulding machine consists essentially of the following principal parts: (a) A hydraulic system which includes the pump, valves and heat exchanger; (b) a hydraulically-operated piston that clamps the mould shut during the injection and cooling periods; (c) a heated cylinder in which the material is softened; (d) an injection ram that forces the feed or material into the heating cylinder and, at the same time, forces the hot material from this cylinder into the mould; (e) two platens to which two halves of the mould are clamped. One of the platens is stationary and the other moves so as to open and close the mould and permit the moulding to be ejected. This platen moves on accurately aligned tie-bars or grooved ways.

The switches, or valves, that control the machine may be hand-operated, but it is more usual to have automatic control by means of electrical interval timers.

In addition to the above essential requirements there will be some additional equipment, such as: (a) A feeding mechanism; (b) temperature and pressure control; (c) ejection device.

305. In the plastics industry there are three basic types of extrusion machine which are generally used. The first, known as the ram or piston extruder, has been superseded by improved types, nevertheless, where a material can be prepared in a plastic state it can be extruded by this method, and such machines are still used. The material is fed into one end of a heated cylinder and forced out by a ram or piston through an orifice.

As will be appreciated, one disadvantage of this method is that it is a discontinuous method, as when the ram reaches the end of its stroke it must be withdrawn and further material inserted. However, such machines involve low capital expenditure and maintenance is simple.

Where it is possible to soften the material by addition of solvents so that no heat is required during the actual extrusion, particularly with highly inflammable materials, the ram process has some advantage.

Secondly, there is the extrusion of monofilaments, in many types of synthetic fibre-forming materials. In this process, low viscosity materials, in the form of melts or solutions, are pumped through a 'die' containing a number of fine holes. This die is called a 'spinneret.' The extruded material on leaving the spinneret is cooled in a variety of ways, *e.g.*, merely cooling with air, passing into a cool coagulating bath, etc.

Thirdly, there is what is known as screw extrusion, which consists essentially of a machine with a screw rotating in a heated cylinder in which a feed opening is placed at one end of the screw and a die at the other. The screw rotates and takes the material through the heated cylinder and is forced out through the die.

The advantage of this method is that the material is heated uniformly in a closed system, the process is continuous and the action of the screw ensures a thorough mixing of the material.

Single and multi-screw machines are commonly used and, of the latter, twin screw machines are more popular.

306. The Standards of the American Institute of Electrical Engineers provides for a classification of insulating materials according to the maximum operating temperatures for a service life of about 20 years, and are as follows, with class and maximum operating temperature in °C.: A, 105; B, 130; E, 120; F, 155; H, 180.

Class B is for organic binders and varnishes, and Class H permits the use of glass, mica, asbestos and silicones. The advantages of Class H transformers containing silicone insulating materials are: (a) By designing for higher operating temperatures there is a saving of materials and space without reduction in efficiency; (b) good surface resistivity in humid atmospheres is ensured because of the water-repellant characteristic of silicones; (c) space heaters are not necessary to dry out transformer windings, and less maintenance is required; (d) rated at 180°C., the insulation will withstand any emergency exposure to very high temperatures; (e) the danger of fire or explosion generally associated with transformer failures is eliminated.

Class H insulated dry type transformers are manufactured ranging from 5 w. electronic coils to 2,000 k.v.a. (15 k.v.) network transformers. They can be air-cooled or sealed in nitrogen.

(More questions next week)

Polly Ester Says . . .

'Smoked sheet—the result of having a cigarette in bed'

MEN and MATTERS

A Review of People and Events

by George A. Greenwood

AS will now be generally known, Mr H. F. Wilson has been nominated for the presidency of the Plastics Institute, and thereby hangs an interesting coincidence. For he will be holding office in the same year that his colleague in industry, Sir John Dean, is president of the Institution of the Rubber Industry. For Mr Wilson is managing director of the Telegraph Construction and Maintenance Co. Ltd., and Sir John is, of course, chairman. The annual meeting of the Institute is on July 22 next.

Mr Wilson, a Londoner, and 57, started his career as personal assistant to Dr H. P. Stevens, now of Beccles, a very prominent man in the business and chemist of the Rubber Association. In a year or so Mr Wilson left to join his present organization when it was the old Gutta Percha Co. In fact, therefore, Mr Wilson has been in both the associated industries for most of his life. He was almost a founder of the IRI, when his associates were men like Mr W. F. B. Cocks, Dr Schidrowitz, and so on. He is a B.Sc., an A.R.I.C., an A.I.R.I., an F.P.I., and a Companion of the I.E.E. A family man, married, with two grown-up children, a son and a daughter, he lives at Sidcup in Kent, and plays golf—but only occasionally now, he says!

Dr Schidrowitz

Mention above of Dr Schidrowitz is a reminder of the fact that he has been elected the first Life Vice-President of the Institution of the Rubber Industry, and a great number of friends will hasten to congratulate him, as I, a fellow contributor to this journal certainly do. It will soon be 40 years ago since he started his association with what is now *RJIP*, and on May 10 1945, Maclaren and Sons Ltd., the proprietors, entertained him, with a party, to lunch to celebrate his 25 years of writing 'Views and Reviews.' Incidentally, this feature has only once failed to appear during that time, and that was during the winter of 1940-41 when, possibly not unconnected with enemy air activity over London, the contribution went astray!

The celebration luncheon was before my time, but I am told that on that occasion high tribute was paid to Dr Schidrowitz's courage and vision. He was, as you will know, one of the founders of IRI, and he has held a number of patents. I suppose we can call him a Londoner. He was educated at St. Charles' College and University College School before studying chemistry at the Federal Polytechnic, Zurich, and the University of Berne. For a long time he was in practice as a consultant and analyst but he has always been known for his contributions to the literature of chemistry and rubber, and his book 'Rubber,' published as long ago as 1911, is still a standard work.

Insulation in Ships

From a friend comes a cutting from a recent issue of *The Manchester Guardian*—a most interesting article about insulation for refrigerated ships by Mr J. M. Buist—'Jack' to his friends, including those who read him in our pages. He has written a lot for *RJIP*, and in this article before me he makes plain, even to the least initiated, what the introduction of insulation to cargo carrying vessels has meant to industry and civilization. I would not have known (or thought) until reading it that in 1957 there were 2,500 ships with a capacity of 180 million cu. ft. of refrigerated cargo space. He deals in a scholarly way with the steps to standardize the thickness of insulation and concludes that 'data which are being obtained from heat balance tests carried out on holds of ships where urethane foam has been employed confirm that the material is an excellent insulator.'

Mr Buist, who is manager of the Urethane Polymers group at Imperial Chemical Industries, has also done a great deal of work with the International Standards Organization.

The Dunlop Surprise

On the strength that it is never too late to retail and to comment upon good news, may I say a word or two about the excellent showing of the Dunlop Rubber Company? For although profits during the past year were a trifle lower—£327,000 to be exact—on a showing of £12,157,000 in total, I gather that tax cuts did a good deal to restore the balance, so that Mr George Beharrell is able to step up dividend by 2¼% to 16¼%, and to give us one new share for every four held. All this more than restores the payment out to the level before the big cuts two or three years ago, but it does something a good deal more than that. It makes perfectly plain that Mr Beharrell and his director-colleagues who look after the affairs of this £161,000,000 enterprise, have a vast amount of faith in the future.

From me, there are probably only two matters that call for comment. One is almost an exclamation of surprise that in view of the boom conditions in the British motor industry, any drop in net profits has to be reported. The other is that the Board feels able to make these quite notable gestures in face of the fact that we must all of us apparently now reconcile ourselves to the considerable increase in the price of raw rubber which for the time being at any rate seems just about stabilized at round about half-a-crown a lb. After all, as I suggested last week, a rise of 6d., which is equivalent to 20% in the course of only a little more than four months, is quite remarkable, and as far as I can see there has been nothing quite like it for a while in commodity prices, excepting, perhaps, in the case of copper.

A Coming Famine?

There are quite a number of people who believe that if Russia and China go on buying as they have been buying, and are still buying, the likelihood is that before very long the difference between supply and demand of the natural product might develop into something like a near famine. I would not pretend to pontificate as to the likelihood of such a situation, but it is not to be forgotten that this is to some extent the view of those who are concerned with the manufacture of synthetics, and there is an old saying which is more relevant nowadays than a cliché, that to be forewarned is to be forearmed.

In a New Setting

When, a few weeks ago, Sir Ewart Smith retired as a deputy chairman

of I.C.I., after almost a lifetime of service, but especially after 13 or 14 years' high-powered activity in charge of the giant combine's efficiency programmes, I predicted that although this was under a company regulation it was by no means the end of his activities in any sort of a way. And I was right.

It is just announced that Sir Ewart is to be chairman of a committee set up by the Ministry of Health to look into the way in which the hospitals and other parts of the Health Service are run. It is also to tell the Government how to increase efficiency and to save money. Sir Ewart is a young 61, a Fellow of the Royal Society and, as his friends know, was from 1942 to 1945 Superintendent of Armaments Design in the Ministry of Supply. He now returns after leaving Millbank to what is virtually Government service, in which I am sure he will shine once more.

But this is what beats me, and how odd it seems to me—that so many great organizations and institutions are now prone to shelve us at three score years. Nor am I the only one to be perplexed or dismayed. I heard the other day that Sophie Tucker, the favourite Red-Hot Momma, rising 80, had been asked by an American reporter if it were true that she was about to retire.

'Nope,' replied Sophie. 'Anybody who retires this side 100 is sissy!'

The Uses of Plastics

And, while still on the slightly facetious side, I was amused at a little occasion which marked a cocktail party at the home of Sir Alfred Bossom, between Piccadilly and the Mall, held in the cause of charity. One of the notable persons present was the Countess of Harewood, to whom a friend was talking when he suddenly noticed that the cigarette she was holding was not lighted, and he struck a match. Then he noticed that it was a fake. It was made of plastic. Why was the Countess flourishing this dud? 'Because,' she said, 'I am trying desperately to give up smoking, but it's comforting to have something like this to hold for a while,' and then she hurriedly thrust the plastic fake into her bag.

A Will Explained

There was great surprise last week when some newspapers announced that the late Sir Walker Shepherd, chairman of Turner and Newall, had left 'only £16,681 net.' The snag was that these reports omitted the operative words 'in Great Britain.' Actually, I am told that his fortune totalled over £350,000 represented by investments in many parts of the world, which accounts for the fact that duty of £156,000 has been, or is to be paid in this country. He left everything to his wife. They had no family.

Bigger Boats of Plastics

Mr G. A. Rawcliffe, vice-president of the Plastics Institute, speaking at the annual luncheon of the Midlands branch at Birmingham the other day, had some interesting things to say. He spoke of the boat 80ft. long which is being made, nearly twice as long as the largest yet made with plastics, and reminded his audience that plastics are being found particularly useful for making sports cars and higher-priced models. And he said this, too, which I certainly did not know before, namely that there is 5cwt. of plastic in every Viscount airliner.

Mr George Carr, general sales manager of Dunlop's Dunlopillo division, has been re-elected Chairman of the British Latex Foam Manufacturers Association for the year 1959-60

South-East Asia

To revert for a moment to South-East Asia, it would be interesting to see whether at this twelfth hour the negotiations in progress for an offer of the ordinary capital of Paterson Simons and Co. is carried to fruition. It was stated last Friday that the directors expected to receive an offer for all the £303,000 capital at 11s. 9d. per 5s. share. The total payment involved, therefore, would be a little more than £712,000, and on the strength of the offer the shares had shot up within a matter of a few hours by 2s. In the light of this new accession of prosperity about which I have been commenting, some Paterson shareholders might well consider that this is not precisely an opportune moment in which to sell!

Incidentally, I was interested in a significant passage in the review of the year made by Sir John Barlow, Bart., M.P., to go out with the statement of accounts of the Klabang Rubber Co. He said, *inter alia:*

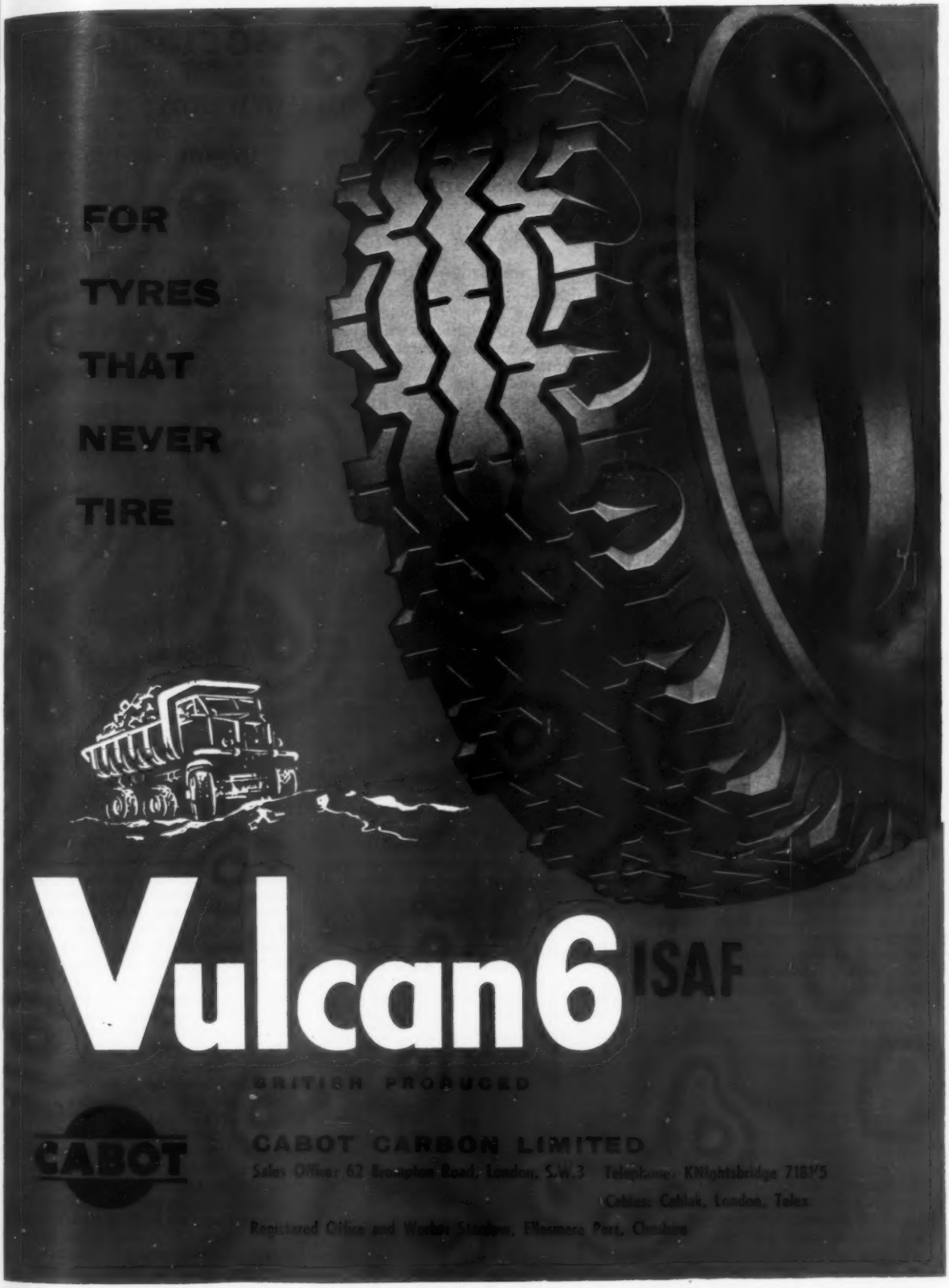
> 'It is pleasing to report that agreement on new wage scales which are to come into operation on June 1 has been arrived at by peaceful negotiations between the Malayan Industries Employers' Association and the National Union of Plantation Workers. It is, I think, a great achievement that Malaya has resumed control of her affairs without loss of goodwill between the various communities.'

This accords absolutely with what people settled in Malaya, as well as visitors from London, have recently been saying about conditions at the Peninsula.

Baron Woolf

The death occurred on April 29, of Mr Baron Woolf, managing director of Lewis Woolf Ltd., manufacturers, of 'Griptight' products, of 144 Oakfield Road, Selly Oak, Birmingham 29.

Excellent results have been obtained on hand-painted armorial bearings by using vacuum formed transparent Cobex rigid vinyl sheet, manufactured by BX Plastics Ltd. Gilt is applied first on the reverse side and is therefore untarnishable and brilliant in appearance. Next, a coat of white is applied on the gilt to throw up the detail, then the remaining painting is done on the top surface with lacquer colours. Transparent Cobex in 15/1000 in. thickness was selected for dimensional stability, toughness and clarity as well as its excellent forming properties. The vac-forming was carried out by B. T. Bennett of Harrow and the hand painting by Garratt and Garratt Ltd., of Cobham, Surrey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The Rubber Growers' Association

OVERALL DEMAND STILL CONTINUES UPWARDS

Increasing Use of Existing Synthetics Slowing Down · Urgent Need for More Natural Rubber and Lower Costs

MR A. W. WALLICH'S CONFIDENCE IN INDUSTRY'S FUTURE COMPETITIVE ABILITY

THE ordinary general meeting of The Rubber Growers' Association (Incorporated) was held on May 8 in London. Mr A. W. Wallich, O.B.E., M.C., the Chairman, presided, and in the course of his speech, said: 'The year 1958 was one of steady progress and successful results for the majority of natural rubber producers. The price of RSS on the spot in London averaged 23¼d. per lb. as against 26¼d.

A. W. WALLICH
retiring chairman, who presided

in 1957, but the difference—so far as profits are concerned—was offset partly by higher yields and partly, in the case of UK producers, by beneficial changes in British taxation.

For the last two or three years production and consumption of natural rubber had been running neck and neck, with a tendency for consumption to travel a shade the faster.

Record Demand for Natural Product

In 1958, world consumption of new rubber — excluding Communist produced synthetic—amounted to approximately 3.2 million tons. Of this figure natural's share — thanks largely to greatly increased demand from Communist countries—was a record at 1.98 million tons against a record production of 1.96 million tons. The overall trend in new rubber consumption still continues upward and there is some statistical evidence that the tendency of manufacturers to use an increasing proportion of the existing synthetics is slowing down. If this is so the demand for our product should also increase. Much will depend on the requirements of Russia and China and on the development of new synthetics; for so long as the price of natural exceeds that of synthetic manufacturers will endeavour to make do with a minimum of natural.

Our industry has in fact reached the stage where it is urgently necessary, in order to counter the advances of synthetic research, to provide sufficient natural rubber at prices competitive with synthetic to ensure that the demand for natural will continue to grow. Potential production is expanding as a result of increased yields from replanted areas, chiefly in Malaya and Ceylon, and also because of new areas coming into bearing in Africa and elsewhere. But will enough be forthcoming at prices competitive with synthetic? Of the estates it can be said as a general rule that they will produce as much as they can without damage to their future economic potential and many companies who foresaw the present trend of events a long time ago are already, thanks to intensive replanting, producing greatly increased crops at low cost. Others will soon be in the same happy position: and replanting continues. The case of smallholdings—which supplied more than half of last year's production of nearly 2 million tons—is different. It is never possible to forecast smallholders' production accurately as many of them do not depend on rubber for their living and tap only when prices are attractive. The majority, however, can supply their rubber at competitive prices but their output is limited, if not actually declining, owing to the age and condition of their trees. If smallholders are to improve their position, more planting with high yielding material is required.

In Malaya both the Government and the industry are very much alive to the possibilities of the situation. In 1955 the Government, it will be remembered, inaugurated its seven-year Replanting Scheme which has already achieved very satisfactory results: and only last December, speaking in the Federal Legislative Council, Mr Tan Siew Sin, the Minister of Commerce and Industry stressed the importance of efficient research as the immediate counter to synthetic competition; and then looking further ahead he went on to advocate the planting up of a million acres of new rubber over the next 10 years. The full achievement of this bold and farsighted policy might not be easy, but it would help to solve more than one pressing problem; for Malaya's population, according to the Federation's 1957 report, is increasing at the highest rate in the world.

Research

On the subject of research much has been written and I shall say only that the policy of the Rubber Growers' Association has always been to support research of the kind which it believes to be in the best interests of the industry; but it is also mindful that the objectives must be primarily commercial and the policy flexible enough to permit of variation with changing circumstances. At the moment, and in the foreseeable future, for example, the urgent need is for more rubber and lower costs. The Malayan Government has refused to be rushed by popular clamour into its selection of a Controller of Rubber Research until it felt it had found the right man. The appointment of Sir Geoffrey Clay, an agriculturist and administrator of considerable distinction and wide experience, has been warmly welcomed. We shall all wish him well in a challenging but very worthwhile task. One most encouraging feature of the relations between Government and the industry has been the degree of consultation on matters of policy; and the Malayan Rubber Fund (Research and Development) Bill is an outstanding example. The Government has listened throughout with sympathy to representations by the industry and has accepted many of the suggestions put forward.

Malaya

Before I pass on, there are a few other matters in connexion with Malaya that I feel I must mention. The first of these is the new agreement between the Employers' Association and the Plantation Workers' Union concluded last February after considerable negotiations, which I feel reflects credit on both the parties concerned. Secondly, I should like to refer to the efforts of the industry to widen the opportunities for local men in estate management. In 1956 our members gave 150,000 dollars to the Outward Bound Trust of Malaya in order to encourage those qualities of leader-

ship and resource that are essential for our purpose. And, in addition, most of the larger Groups have introduced on to the management side of their estates, locally born trainees on the same terms as European assistants. Although most Groups can point to a measure of success progress has been somewhat disappointing. It may be that the cream of Malaya's youth is at present attracted to the professions, but in a country whose economic future is so closely bound up with its agricultural efficiency this seems paradoxical. It is to be hoped that the prosperity of the rubber industry itself will in time bring forward the right type of men in larger numbers.

Politically, the year in Malaya has been one of peaceful advancement and Tunku Abdul Rahman, who has recently laid down his office of Prime Minister in order to devote his energies to Party matters, has expressed himself as very well satisfied with the prosecution of active measures against the Communist terrorists. It has been estimated that some four-fifths of the population and four-fifths of the country has been freed from their influence. But not all Communists are active terrorists, and the Malayan Government is firmly resolved to prevent the achievement through subversion of what the insurgents failed to gain by open rebellion. The determination of the Alliance Government to maintain security and racial harmony and the steps it is taking to tackle rural poverty and to provide a livelihood on the land or in new industries for the fast increasing population are impressive features of the administration. It is clear Malaya intends that her independence shall have reality and meaning, and the respect which she has already won among the nations is a source of admiration to the world—and to her friends.

Indonesia

For our members operating in Indonesia it has been another difficult year and there are unfortunately few, if any, signs of an early improvement. The armed conflict continues in Sumatra and Celebes and security conditions in many parts of the Archipelago have deteriorated, leading in some cases to the evacuation and even destruction of British properties. The high military expenditure and that required for large rice imports continue to make heavy calls on the Government's foreign exchange reserves, already weakened by illicit trading.

Even more important to our members, nationalization of the Dutch estates and of the expressed desire of some Indonesian spokesmen to do away with all 'capitalistic' enterprise, whether foreign or Indonesian, had already caused grave misgivings; and the recent developments in North Sumatra in regard to concession titles seem to justify these fears. For this reason the statements made by the Prime Minister, Dr Djuanda, and his Ministers that there is no intention of nationalizing British estates and that lease and concession holders are to be given the opportunity of renewing their titles are most welcome, as is the latest information that the taking over of certain Sumatra estates, planned for the end of April, has been suspended pending official enquiry. The outcome will be keenly awaited.

It is to be hoped that President Sukarno's conception of 'guided democracy' will succeed in associating the ablest of Indonesia's administrative and financial talent in laying the foundation of economic stability and progress. How challenging and urgent this task is may be gathered from the President's own words when he proposed a return to the constitution of 1945. 'In all fields we are deteriorating continuously.' British interests have done much for Indonesia in the past and provided they are given the encouragement they deserve and need they can still contribute to her future prosperity.

New Chairman

Mr Thomas Henry Miller, formerly vice-chairman, has been appointed chairman of the Rubber Growers' Association in succession to Mr A. W. Wallich. Mr Miller, who is widely known in the rubber industry, is a

T. H. MILLER

director of R. G. Shaw and Co. Ltd., of Shaw, Darby and Co. Ltd., Oriental Estates Agency Ltd., Leadenhall Nominees Ltd., and a number of other companies. He has been a member of the council of the Rubber Growers' Association since 1951 and he has also served for many years on the Malaya Committee, the Commercial Research Committee and the Technical Committee of the Association.

Take-Over Bids

After referring to the rubber situation in other producing territories Mr Wallich went on to say: I now propose to touch on the subject of take-over bids for rubber estates. One of my predecessors described it as a process of pulling down what others have built. This is true, but whether it is a good or a bad thing, is, of course, a matter of opinion and circumstance. For the shareholder whose stock stands below its real value in the market, if it increases that value it is obviously good. The workers on the estate see it differently. Is their job safe? The trade unions are worried and have made representations to the Governments concerned. The European who has chosen planting as his career, and has served his company faithfully, often in danger and discomfort, feels keenly the precariousness of his position; and compensation does not always provide a satisfactory solution. And next, what of the producing countries? Politically, the transfer of agricultural land to the indigenous peoples fits well into the background of independent nationhood; but if the breaking up of large, organized estates into smallholdings attained considerable proportions the ultimate result on the economic structure of the country could hardly be beneficial. Among investors many have done well; others may be wondering sadly if they did not yield prematurely to the take-over syndicates; others again, whether they will see their money back. The take-over operators themselves have pocketed substantial untaxable pickings, but some transactions have not been of a kind to inspire public confidence; and future propositions and their authors will certainly come in for searching scrutiny.

Resilience of Natural Rubber

If toughness and resilience are the salient characteristics of natural rubber they are surely reflected in the industry itself. In the past 30 years it has survived an all-time low price of 1⅛d. in 1932; a Japanese occupation of the Far East from 1942 to 1945; in Malaya a Communist assault aimed in 1948 directly at the plantations and mines, only now subsiding; and in Indonesia a long period of political and industrial uncertainty. Now—as for many years past — it lives under the shadow of competing synthetics, built up to formidable proportions when the estates were to a great extent going back to jungle under the Japanese. Yet even here there are compensating factors, for the development of synthetics has been on the one hand an incentive to greater effort and on the other to a safety-valve that has, to some extent, governed the price of natural.

The Outlook

Since the turn of the year prices have again moved upwards and there has been much discussion of the cause and the possible repercussions; but some commentators seem to have missed the point that this is a free market and that the price is determined by what the buyer is prepared to pay for the quantity he needs.

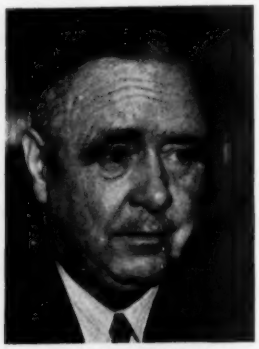
It has been said that there is room

in the world for both natural and synthetic rubber. I agree and I will go further and say that since nine-tenths of the world's natural rubber comes from countries in South-East Asia whose economies depend largely or vitally on its production, I consider it to be a matter of the very greatest interest to the Western world that natural and synthetic rubber should continue to exist peacefully side by side.

During the years since the war, in spite of many difficulties, much has been achieved. We all realize that much remains to do, but I believe we may look forward with confidence, firstly because our product is in demand and appears likely to continue so; and secondly because our industry has probably never been better poised for the task that lies ahead—that of becoming and remaining fully competitive in a competitive and scientific age.

New Vice-Chairman

Mr William Anderson has been appointed vice-chairman of the Rubber Growers' Association. Born and educated in Scotland, Mr Anderson first joined Boustead and Co. Ltd. in 1924 and went out to Malaya in that year where he was connected with the company's estate agency business in the Penang area. He was interned by the Japanese during the war and on its completion rejoined Boustead's in Kuala Lumpur. He was vice-president of the Malayan Planting Industry Employers Association, of which he had been a member since its inception, and he was also vice-president of the United Planting Association of Malaya. Mr Anderson returned from Malaya to this country in the spring of 1954 and since that time he has been a member of the Rubber Growers' Association, and, last year, convenor of its Malaya Committee. While in Malaya he was a director of a number of locally registered rubber planting companies and chairman of several. Mr Anderson, who is 58, holds directorships of Edward Boustead Ltd., Boustead and Co. Ltd., Taiping Rubber Plantations Ltd., Cheras Rubber Estates Ltd., Windsor Rubber Estates Ltd., and Broome Rubber Plantations Ltd.



W. ANDERSON

Asbestos Corporation

A. L. PENHALE, president of Asbestos Corporation Ltd., Canada, told shareholders at the annual meeting that he anticipated lower net income for the corporation this year. Mr Penhale said he hoped and expected earnings would be sufficient to cover dividend requirements. Last year, Asbestos reported net profit at $4,134,769 equal to $2.30 a share. In calendar year 1958, the company paid $1.75 a share in dividends, made up of three quarterly payments of 25 cents and a quarterly payment of 30 cents plus an extra of 70 cents in final quarter. The final dividend of 30 cents was described as an annual basis of $1.20.

Mr Penhale said that although the economy had shown a general improvement in tone during the first quarter in the US, it had not yet been translated into a surge of buying. In addition, he declared, more hesitancy was being shown in Europe than at the same time last year. There was also, he added, a world surplus of most asbestos fibres. 'The coming year will be typical, with results expected to be below those of 1958, but most experts agree that the long-run outlook is good.' He said following the meeting that no change was expected in the keen competition from Russian asbestos producers.

Canadian export potential of asbestos could be improved, Mr Penhale said, with easier exchange import controls in dollar-hungry South American markets where governments are trying to stabilize generally weak economies.

FBRAM

ASSOCIATION AGMs

AT the annual general meeting of the British Rubber and Resin Adhesive Manufacturers' Association, held in Shawbury on May 5 1959 the following officers were re-elected for 1959-60: Chairman, Mr D. E. Cameron (B.B. Chemical Co. Ltd.); vice-chairman, Mr N. G. Bassett Smith (Dunlop Ltd.).

At the annual general meeting of the British Mechanical Rubber Manufacturers' Association, held on April 29 1959, the following officers were re-elected for 1959/60: Chairman, Mr W. E. Prior, The Northern Rubber Co. Ltd. Vice-chairman, Mr J. W. Mann, Joseph Lucas (Electrical) Ltd.

At the annual general meeting of the British Wrapped Rubber Hose Manufacturers' Association held on April 29 1959, the following officers were elected for 1959/60: Chairman, Mr P. L. Sherwood, Wm. Warne and Co. Ltd. Vice-chairman, Mr D. P. G. Moseley, David Moseley and Sons Ltd.

The Poolmaster Junior-Jet, a new lightweight hydro-jet vacuum cleaner made for cleaning small swimming and wading pools, popular in America, is being manufactured by Kennerley-Spratling Inc., Berkeley, Calif, out of Tenite butyrate supplied by Eastman Chemical Products, New York. It works on water pressure from a garden hose. The cleaner comes equipped either with a brush, recommended for plastic pools, or with wheels, for concrete and other hard-surfaced pools

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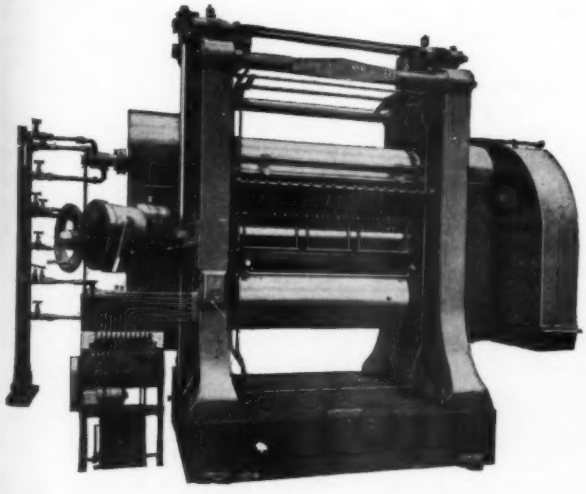


24" dia. x 68" face 3-ROLL EVEN and FRICTION SPEED RUBBER CALENDER, with Patent Nip Feed Guard, Circular Lubricating System from individually driven 12-point Forced Feed Lubricator with Self Filling Pumps. Mechanically Operated Elevating Unit for top and bottom Rolls. Variable Speed Drive to suit any requirement.

Plastics at Work

RESIN BONDED GLASS FIBRE PRODUCTS

By DAVID ALEXANDER

IN a previous article (RUBBER JOURNAL AND INTERNATIONAL PLASTICS, April 11 1959) the properties of resin bonded glass fibre were generally examined. The figures given then were intended only to give a basic idea of the very useful overall properties of resin bonded glass fibre materials.

However, before considering practical applications in the factory for resin bonded glass fibre, it is, perhaps, necessary to look a little deeper into the technicalities of these materials in order to understand why such a wide and varying range of both resins and glass fibres is produced. In many cases a 'tailor-made' bonded glass fibre should be selected in order to give the most economically and technically correct product. Already various reports are filtering through claiming that resin bonded glass fibre has fallen down on the job, sometimes because of bad and skimpy methods of production, sometimes through cheap and undetermined or wrongly selected resin and sometimes the wrong filament size of glass fibre.

Fabric Types

There are many types of glass fibre fabric available commercially, the basic number laid down by the Ministry of Supply in their Specification DDT 5518-5519, being 32 apart from which there are additional cloths made by most of the suppliers. Various factors have to be considered in the production of glass fabrics, such as the weave, the number of warped threads and weft threads, and the counts of yarn used from which the breaking strength, weight, thickness and the closeness of the threads can be determined. From the fabricator's point of view such properties as stiffness and handling must be taken into account as well as the wetting out of the fabric towards the resin.

In selecting the correct fabric one of the first factors to be considered is, perhaps, the type of stress that the finished product has to take. Normally laminates have one-directional or two-directional properties and according to the design of the weave, so these properties are transmitted to the finished product when the fabric and the resin are bonded. The more glass in total used up to an optimum point in the right way, the more strength to the product, allowing, of course, for a total and efficient covering by the resin. At the same time, however, it must be borne in mind that the strength of the laminate increases as the diameter of the filament decreases. Also, the strength of the laminate decreases as the percentage of resin used increases.

Basic Types of Filament

Three basic types of filament are in general use for the production of fabrics for lamination by continuous filament glass, these are 450's, 225's and 150's, these being in increasing diameter order. Some 200 of these filaments together make up simple yarns which are again joined to make up multiple yarns. From this it should be seen, therefore, that a 450 fabric is stronger than a 250 fabric and more flexible. This property is particularly useful when sharp curves or radii are involved in the mould. Also the wetting out of the resin is quicker. It is as well to mention here that in spite of the above statement the writer is aware of no accurate formula to show the relation between fabric properties and the resultant laminate properties. However, generally speaking, it is fair to say that an increase in the amount of yarn in one direction will give an increase in properties in the same direction in the resultant laminate. In the laying up of large structures where the ultimate in resin-bonded glass fibre strength is not necessary and where tight tolerances are not required, it is very often more economical to use heavier fabrics. This fact is quite important when one bears in mind the comparatively high costs of some glass fibre products. Alternatively, when the constructional requirements for the end product call for precision and maximum strength, it is advisable that thinner fabrics be used. At the same time it is worth remembering that the strength of a glass fibre product comes basically from the glass and the various mechanical properties derive from the fact that each filament of glass is small enough to allow complete penetration and intermingling with resin.

The importance of the selection of fabric can thus be appreciated, likewise something of the complexity of problems involved in selection.

Resins

As with glass fibre there are many types of resin on the market, both polyester and epoxy. Also each manufacturer makes resins which have particular properties which may not coincide accurately with the nearest equivalent grade. It is, therefore, important, to evaluate individually different manufacturers' grades of resins for production purposes, otherwise the properties of the resultant laminate may vary considerably from the original specified requirements. Fortunately in the UK there is generally reliable technical service and information available on these matters. However, this is not always the case with some of the foreign resins arriving in the UK where to a great extent evaluation is done by the customer on a trial and error basis. The use of unknown resins by fabricators, usually because they are cheaper, can result in end user difficulties at a later date, leading to the criticism of resin-bonded glass fibre products which, at this stage in the commercial developments of the product, it is important to avoid. To a great extent the responsibility for this lies with fabricators of resin-bonded glass fibre products.

In the previous article an example was quoted of a case in which one company quoted £34 10s. for a tank and another company quoted £25 10s. for an identical tank. It may well be that the higher quotation arose from over caution in the amount of fibre and resin used or, alternatively, it may be that the price of £25 10s. was only reached by cutting down both resin and fibre to an absolute minimum. To complicate the matter further, it may be that the cheaper tank is the stronger and that part of the high cost of the expensive tank is due to an excess of resin being used. Again it could be due to different production techniques. The main point, however, is that as yet there are many divergent opinions on the techniques of production of tanks and, therefore, more so at this stage than, perhaps, later, it is necessary, when considering the use of glass fibre, to go into these matters in some detail.

Apart from the resins there are, of course, the accelerators and catalysts

which are used in conjunction with these resins and without which the whole technique of bonding glass fibre with resin would be difficult, if not impossible. There are various recognized percentages of each of these used. A normal commercial mix which is recommended is 100 parts of resin at 65°F. to 3 parts of accelerator to 3 parts of catalyst. An interesting point is that at 85°F. to 100 parts of resin only 1 part of accelerator and 1 part of catalyst is required. Also, fire retarding agents such as antimony oxide and a chlorinated hydrocarbon are used in quantities varying from 5 to 15% of each.

The chemical and mechanical properties of resins vary widely and, therefore, selection is of considerable importance. Generally, where possible, polyesters are used as the difference in price between polyester and epoxy is considerable. For example, the former may be approximately 3s. to 3s. 6d. per lb., whereas the latter may be up to 8s. 9d. per lb.

Fabrication

So far the variables affecting both glass fibre and resin have been examined. However, another factor which in many cases causes more trouble than either resins or glass fibre is the fabrication or manipulation of these materials when making an end product.

Basically, the fabrication process consists of impregnating the glass fibre with resin and allowing it to harden on a suitable mould. This hardening can take place either with heat or without heat and sometimes with pressure. Firstly, before commencing production of, say, a tank, it is necessary to decide whether the inside or outside surface is more important as from this it may be decided whether a male or female mould should be used. This mould can be made from resin-bonded glass fibre and in the case of a female mould a male die of wood, plaster or even metal can be used. Whichever die is used it is necessary to make sure that no undercuts are involved and that the whole die has been smoothed to give the best possible finish as any defect will show up in the finished product. In the case of wood or plaster it is advisable to put over-layers of either polyester or shellac varnish on, after which the die should be wax polished, this also being necessary with metal, after which a release agent is applied so that no sticking takes place.

In the case of moulds similar precautions should be taken.

Having produced the moulds and dies the next thing to do is to select the type of resin as, of course, drainage takes place when sloping surfaces are involved and therefore some form of thixotropic resin should be considered. After the surface of the moulding has been covered by resin the reinforcement of glass fibre in one form of weave or another is then cut out and it is advisable to cut out beyond the dimension of the mould and to trim later. During this process of laying the glass fibre and the resin it is essential to eliminate air bubbles, while another factor is the incorporation of reinforcement sections, such as ribs or webs, to give extra rigidity. A point with regard to the use of webs is that occasionally these are sometimes made too rigid, resulting sometimes, in severe conditions, to fracture at the web points. It is, therefore, wise to design these reinforcements to allow for some degree of flexibility. Sometimes the technique of indenting the fibre glass to give full strength does not, in practice, prove to give the expected result and in fact, in severe conditions, the strengthening indent is the point where failure may occur.

In normal hand lay up conditions the newly-produced moulding should be allowed to remain in the mould for up to 14 hours to prevent warping which could take place before curing is completed. Obviously it is not always economical to leave the mould out of production for this time in which case the moulding can be removed earlier and jigged for a few days. Sometimes to reduce the curing period a heating of the moulding up to 90 to 100°C. will help.

When the moulding is removed, this should be rubbed down with steel wool and sand paper, after which it should be cleaned and then covered with primer. According to the conditions in which the finished product is to operate it may be surface finished with either phenolic, cellulose, or alkyde resin-based enamels.

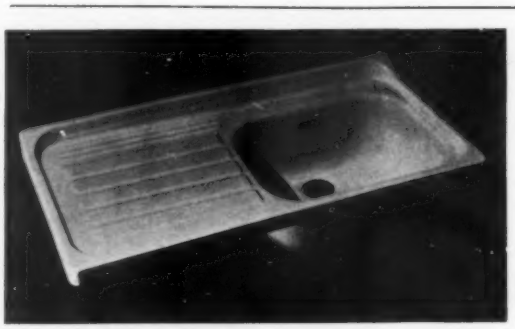
Accurate Selection

Correct procedures in conjunction with the accurate selection of resins and glass fibre fabric make possible a very considerable range of applications for these tanks. For example, one of the largest tanks installed in glass fibre holds 100,000 gallons. Apart from the chemical resistance of these products they also offer resistance to abrasion especially when the correct resin is selected. Inevitably there are teething problems which at the moment arise with the use of glass fibre tanks and pipe lines, particularly such occurrences as the seaping of liquid from bolt hole points, but there are techniques for dealing with this and these are sufficiently simple to allow end users to carry out their own necessary precautions.

To summarize; it is necessary to bear in mind three main factors, the selection of the resin, the selection of the glass fibre fabric and the selection of the correct technique. As experience grows in the production of the wide range of potential products for which glass fibre can be considered, there is no doubt that a number of the earlier criticisms will disappear. The producers of glass fibre and resins are well aware of the complex nature of the matter as can be seen from such occasions as the Reinforced Plastics Technical Conference under the auspices of the British Plastics Federation at Brighton last year, where all these factors were discussed and considered in much detail. As yet one cannot be sure that all fabricators, especially perhaps the small companies, are taking their responsibilities so seriously.

Extrudex Pipes and Fittings

Standardized stock pipes and fittings are now available from Extrudex Ltd., Highams Park, London, E.4. The pipes and fittings are being mass produced from ½in. to 3in. bore. A chart showing availability of ex-stock in London, Birmingham, Manchester and Glasgow, is available from the company.



The Marley Group, Sevenoaks, Kent, has introduced a new range, Marleyware. The first item in this range to come onto the market is a polyester glass fibre sink unit made in cream, green and deep red. Initially there are two sizes, with single and double drainers, and these are retailing at £11 and £13 15s., respectively. The next item in this range will be a bath. In standard colours, the retail price will be £42 10s. 6d., with side and end panels at £4 10s. and £2 14s. respectively

Rubber Statistics

MALAYA — UK — JAPAN — VIETNAM

THE March Bulletin of the International Rubber Study Group amplifies the preliminary information regarding the world rubber position at the end of January which was published in this journal on April 18. The following table is expressed in 1,000 long tons and gives details of natural rubber production during this January as compared with January last year.

NATURAL PRODUCTION

	January 1959		January 1958	
Malaya:				
Estates	37½		35¾	
Smallholdings ..	27¼		25½	
	—	64¾	—	61¼
Indonesia:				
Estates	20¼		22½	
Smallholdings ..	22½		11½	
	—	42¾	—	34
Ceylon		9		10
Thailand		21½		9
Sarawak		2½		2
Other British Borneo		2		2
Liberia		4½		4¾
India		2¼		2½
Belgian Congo ..		3		2½
Others		15¼		19½
		167½		147½

It is apparent from this table that there was a considerable increase in natural rubber production compared with a year ago, though the total for December was considerably higher (190,000 tons); this, however, probably included a number of year-end adjustments.

The following table sets out the natural rubber consumption position for the month of January in both years.

NATURAL CONSUMPTION

	January 1959	January 1958
UK	15¼	15¼
USA	50	42½
France	12	12½
Western Germany ..	12½	11½
Remainder of Europe (estimated)	39	35½
Others	63¾	35¼
	192¼	152½

The synthetic rubber consumption position is set out in the following table and again a marked increase in US consumption is evident.

SYNTHETIC CONSUMPTION

	January 1959	January 1958
UK	6	5
USA	89½	72½
France	5	5
Western Germany ..	5	4½
Remainder of Europe ..	4¾	4
Others	12¼	9
	122½	100

UK Position

Details are now available of the UK rubber position up to the end of February.

Natural rubber consumption during February, which was a four-week period, amounted to 13,756 tons, giving a weekly average for the month of 3,439 tons (January 3,054). Up to the end of February, 29,030 tons had been consumed against 31,378 tons consumed during the same period of last year.

Stocks of natural rubber on hand at the end of February totalled 33,825 tons, an increase of more than 4,000 tons compared with the stock position at the end of January; of this total, 20,330 tons were held by manufacturers and 13,495 tons were in warehouses.

Synthetic rubber consumption in February totalled 5,700 tons, giving a weekly average of 1,425 tons (January 1,169). Consumption of synthetic for the first two months of the year amounted to 11,544 tons (1958 10,398). Stocks of synthetic rubber on hand at the end of February totalled 12,111 tons compared with stocks of 12,814 tons held at the beginning of the month.

Japan

According to the Japanese Rubber Importers Association imports of crude rubber in February amounted to 11,094 tons (11,490 in January). Imports of latex totalled 1,109 tons, an increase of over 300 tons compared with the January figure. Imports of synthetic latex totalled 156 tons, a reduction of 100 tons, and of this amount the USA provided 155 tons. Imports of styrene butadiene, excluding latex, totalled 993 tons (1,271 in January). Waste rubber imports totalled 647 tons. Consumption of crude rubber during February is estimated by the Rubber Importers Association at about 11,500 tons (estimate for January, 10,000 tons).

Vietnam and Cambodia

Further details of rubber production in these countries during 1958 have now been released. These show that Vietnam produced 70,524 tons of rubber, of which all but 8,851 tons were produced on plantations of more than 500 hectares in extent, and of the balance, all but 846 tons were produced in South Vietnam. The total production was made up of 49,161 tons of smoked sheets, 1,164 tons of smoked sheet cuttings, 883 tons of sole crepe and cuttings, 518 tons of latex crepe, 13,741 tons of other crepe, 1,262 tons of flat bark, 2,756 tons of sernamby and 1,039 tons of latex (dry rubber content).

Exports from Cambodia during 1958 totalled 28,432 tons, and consisted of 12,061 tons of smoked sheets, 252 tons of sole crepe, 3,984 tons of ordinary crepe, 165 tons of latex crepe, 992 tons of skim crepe, 2,568 tons of flat bark and 8,410 tons of latex.

Of these exports the US took 20,909 tons and France took 4,986 tons. Other countries taking this rubber included the UK (443 tons), Germany (683 tons), the Netherlands (251 tons), Malaya (574 tons) and Mexico (511 tons).

Patterned Plastics

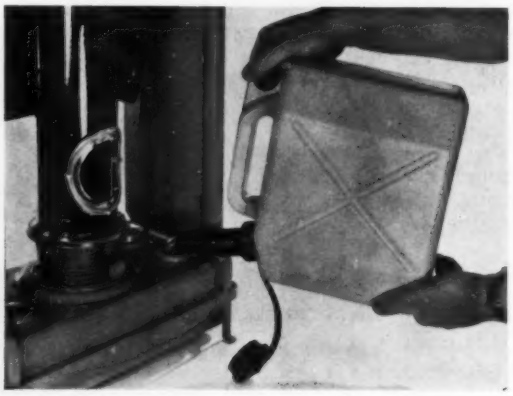
Currently on show (until June 6) at the Design Centre, London, are examples from the new plain fabric ranges of Bernard Wardle and Co. Ltd., Chinley, and patterned plastics of Bernard Wardle (Everflex) Ltd., Caernarvon.

Two new designs, Gamba and Cambria, are shown in the company's range of PVC-coated fabrics. Everflex can be used for upholstery, wall coverings, travel goods, protective clothing, handbags and the motor trade. Cambria is available in 15 colours and Gamba in 12. Prices range from 10s. 10d. to 14s. 6d. a yard.

PI Examination

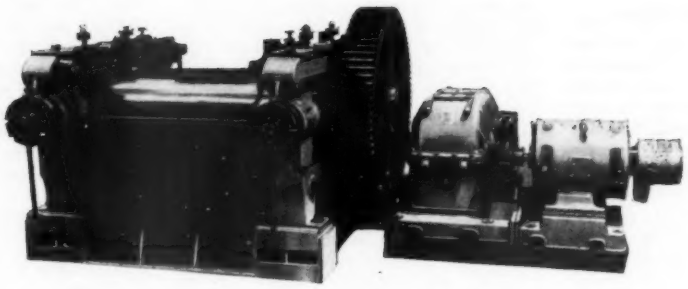
A record number of 133 candidates, 36 more than last year, will sit 1959 Examination of the Plastics Institute, to be held in a number of centres from June 8 to 13.

Mr J. C. Givan has been appointed to the boards of the Bukit Badang Rubber Co., Raja Musa (Selangor) Rubber and Coconuts and the Sungei Buloh Rubber Co.



A new 1-gallon container for storing and transporting liquids has been introduced by Lacrinoid Products Ltd., Stafford Avenue, Gidea Park, Essex. The new container, known as the 'Handycan,' is blow-moulded in Rigidex high-density polythene supplied by British Resin Products Ltd. Available in two colours — white and yellow—the 'Handycan' retails at 17s. 9d.

Latex Engineering Co



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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 3s. 6d. per copy (including postage).

Vulcanizable Polypropylene

No. 811,848. Montecatini Societa Generale per l'Industria Mineraria e Chimica. Application and Filed, August 3 1955. Application in Italy, August 6 1954. Published, April 15 1959.

A vulcanizable elastomer is made by chlorinating a substantially linear, head to tail polypropylene to a chlorine content of less than 12% by weight. Alternatively, the polypropylene may be chlorosulphonated to yield a vulcanizable product containing 2-10% by weight of chlorine and 1-3% by weight of sulphur, such a product being very readily vulcanized. In either case, the vulcanizable products have a molecular weight above 5,000. Vulcanization of the chlorosulphonated polypropylenes may be carried out by heating in the presence of metal oxides, such as lead or magnesium oxides, and an accelerator such as MBT. The vulcanized products have the properties of an elastic rubber with an elongation at break above 400% and a tensile strength of 4-5kg./mm.^{2} (referred to the cross-section at break).

Polythene Compositions

No. 809,484. Esso Research and Engineering Co. Application and Filed, September 17 1956. Application in USA, October 20 1955. Published February 25 1959.

Film for use in packaging food, particularly meat, is made from a polythene composition containing 25 to 40% of a poliso-olefin having a molecular weight about 140,000. The polyiso-olefin may contain up to 10% by weight of a copolymer of an iso-olefin and a vinyl aromatic hydrocarbon. A particularly suitable composition comprises 70% of polythene, 27% of polyisobutylene of 140,000 to 300,000 molecular weight and 3% of a copoplymer of isobutylene and styrene containing 55 to 65% of styrene and having an intrinsic viscosity below 0.5.

Organosilicon Foams

No. 809,497. Midland Silicones Ltd. Application and Filed, June 27 1957. Application in USA, October 15 1956. Published, February 25, 1959.

An organosilicon foam is prepared by mixing (1) an organopolysiloxane, (2) a catalyst and (3) a non-acidic hydroxylated compound, and allowing the mixture to expand to a foam at room temperature by evolution of hydrogen. The organopolysiloxane has on the average from 1 to 1.8 organic radicals per silicon atom selected from monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and halophenoxymethyl radicals, at least 1% by weight of the siloxane units in the polysiloxane having at least one hydrogen atom attached to the silicon atom. The catalyst is a quaternary ammonium salt or an alkali metal salt of a silanol or a siloxanol, an alkali metal hydroxide, or a carboxylic acid salt of tin or lead. The hydroxylated compound may be an organosilicon compound containing silicon-bonded hydroxyl groups, so that items (1) and (3) in the mixture may be identical.

The organosilicon foams of the invention are uniform in pore size and density, and generally range in density from 3 to 30lb. per cu. ft. They may be used as thermal insulation for pumps, motors, pipes and fire walls and as light-weight reinforcing material in structural members.

Block Copolymers of Formaldehyde

No. 807,589. E. I. du Pont de Nemours and Co. Application and Filed, November 16 1956. Application in USA, November 30 1955. Published, January 21 1959.

Block copolymers of formaldehyde are made by polymerizing formaldehyde in the presence of a polyglycol or other polymer containing active hydrogen atoms and having a polymeric unit which is chemically different from polyoxymethylene. Polymerization is carried out in solution in an organic solvent and in the presence of a polymerization initiator. The block copolymers thus prepared have good toughness, thermal stability and plasticity. Those produced by copolymerizing formaldehyde in the presence of polyglycols have a combination of clarity, flexibility and heat stability which makes them of special interest in the preparation of films and sheets. It is stated in the Specification that they are the first known copolymers containing polyoxymethylene chain units.

Reinforcing Fillers for Rubber

No. 807,911. The B. F. Goodrich Co. Application and Filed, May 19 1955. Application in USA, May 28 1954. Published, January 21 1959.

A reinforcing filler for natural and synthetic rubbers comprises a particulate inorganic material, containing silicon and oxygen, coated with a minor amount of polyhydroxy compound. The inorganic material is one of the following substances: arc silica, silicon oxyimide, fibrous and spherical silicon monoxide, fibrous silicon dioxide and fume silica. Examples of suitable polyhydroxy compounds are as follows: trimethylol hexane, glyceryl monolaurate and 1,1,1,-trimethylol-2,4,4-trimethylpentane.

Data are included showing the effect of the coated fillers on the properties of natural rubber compounds and SBR compounds. The modulus, tensile strength and elongation of the vulcanized compounds are better than those exhibited by compounds containing the corresponding uncoated fillers. The coated fillers approach carbon black in regard to reinforcement of rubber and in particular, compounds containing the coated fillers show an abrasion resistance comparable to, and in some cases better than that of similar compounds containing carbon black. The coated fillers have the advantage over carbon black that they can be used to produce white rubbers.

Shorter Abstracts

Resinous Compositions. 808,662. Shawinigan Resins Corporation. Filed February 29 1956. — An insulating composition for coating wires and other electrical products comprises 100 parts of a polyvinyl acetal and 18 to 400 parts of a polyurethane dissolved in an organic solvent.

Ethylene Polymerization. 808,667. Imperial Chemical Industries Ltd. Filed, March 20 1957.—Tetrazenes are claimed as catalysts for the polymerization of ethylene at elevated temperatures and superatmospheric pressures.

Shaping Foamed Latex. 808,679. The Goodyear Tire and Rubber Co. Filed, September 10 1956.—A stiffening agent, *e.g.* a water-soluble protein, is added to natural or synthetic rubber latex, the latex is foamed and the ungelled foam is shaped in a continuous manner by passing it beneath a shaped doctor blade, *e.g.* of arcuate cut-out section.

Latex Foam Rubber. 808,964. Chemische Werke Hüls AG. Filed, April 10 1957.—Graft polymer latices, prepared by polymerizing butadiene in the presence of a butadiene-styrene copolymer, are used for the production of latex foam rubber. The foam rubber has a high resistance to compression.

Windscreen Wiper Blade. 809,228. General Motors Corporation. Filed, November 27 1957.—The surface of a rubber windscreen wiper blade is coated with chlorinated rubber. The coating is resistant to abrasive wear and has a low coefficient of friction on a wet windscreen.

Coating Fabrics with PVC. 809,290. Fothergill and Harvey (Research and Development) Ltd. and Vinyl Products Ltd. Filed, November 29 1956. — Adhesion of a coating of PVC to fabrics made of synthetic or mineral fibres is effected by impregnating the fabric with a bonding agent and curing the bonding agent prior to application of the PVC. The bonding agent comprises a mixture of plasticized PVC, an epoxy resin and a hardener for the epoxy resin, the mixture being applied in the form of a dispersion in an organic medium.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

OVER the past few weeks the trend in stock markets has been upwards. This has brought many of the top grade industrials into demand and has lifted prices on several occasions to new peak levels. It is worth while pointing out that the demand is coming from the investor (rather than the speculator) who seems to be prepared to discount the uncertainties of the election.

The shares of the plastics and rubber manufacturing companies have taken part in this all-round rise and our accompanying share table has no less than sixteen new high levels.

One of the better features during the month has been the ordinary shares of the COURTAULDS giant. The buying here was touched off by the news that the company was making an offer for the capital of the Harbens concern. The demand for the share remained buoyant despite a warning from the Courtaulds' directors that they did not anticipate a rise in earnings in the current year. The buying of Courtaulds' shares is based on the long-term rather than the short-term outlook. It is felt that the company's real growth potential lies not so much in its fibre interests as in the packaging and plastics sphere.

DUNLOP RUBBER ordinary were bought up to around 30s., a new peak level and a gain of 3s. 6d. on our previous price. The company has recently announced a final dividend of 12-1/12% which brings the year's total up to 16¼%, a gain of 2¼% on last year's payment. There is also news of a share bonus in the ratio of one new share for every four ordinary already held. The group trading balance comes out at £19,761,000 against £19,860,000 last time. After a slightly increased charge for depreciation and a considerably reduced taxation bill the group net profit is around £771,000 higher at £5,797,000. The authorized capital of the company is to be increased from £40,000,000 to £50,000,000. An increase of this order is usually taken in the City as an indication of long-term expansion plans. The ordinary shares at the current level of 29s. 6d. return in excess of 5½% and the present dividend is more than twice covered by earnings.

The shareholders in ROBERT PICKLES have had some good news. After a two-year lapse the dividends are to be resumed with a payment of 25%. The directors report a profit of £20,730 against a loss of £580 in the previous year. The above figures are struck after tax of £7,400 compared with £1,600.

Hopes of an increased profit in the current year have brought in buying orders for JOHN DALE ordinary shares which at one time have been as high as 16s. 3d. DISTILLERS ordinary have also been an exceptionally firm market and the City takes the view that the price could go higher yet.

SUSSEX RUBBER ordinary have, however, remained at around 1s. 4½d. This stabilized price was rather surprising in view of the chairman's recent warn-

Continued on page 760

Share Price Movements

Par Value	Company	1958-59 High	Low	April 25	Latest
5/-	Albright & W. Ord. ..	21/7½	13/4½	22/4½	24/6
£1	,, ,, ,, 5% Pref...	16/7½	15/4½	16/3	16/3
5/-	Anchor Chemical Ord...	13/6	10/3	13/6	13/–
5/-	Andersons Rub. Ord. ..	4/3¾	3/–	3/0¾	3/1½
2/-	Anglo-Amer. Vulc. Fibre Ord.	4/3	2/–	3/3¾	/3
£1	Angus Geo. Ord. ..	29/10½	21/–	28/3	25/7½
5/-	Armitage (Sir Elk.) Ord.	4/10½	2/3	4/6	4/6
5/-	Ault & Wiborg Ord. ..	14/9¾	11/9	13/–	14/9
£1	Avon India Rubber Ord.	42/–	27/–	37/3	40/–
£1	,, ,, ,, 6% Pref.	18/6	17/3	17/6	17/6
10/-	Bakelite Ord.	27/9	17/–	27/–*	26/10½
£1	,, 6% Pref. ..	19/6	18/3	18/3	18/3
£1	Baker Perkins Ord. ..	47/–	30/7½	45/–	43/9*
4/-	Bank Mdg. Rubber Ord.	2/7½	1/6	1/10½	2/–
5/-	Boake (A.) Roberts Ord.	18/6	9/–	13/3	13/4½
£1	,, ,, ,, 5% Pref.	15/1½	13/9	13/9	13/9
4/-	Bramma H. Ord. ..	18/3	9/–	16/4½	18/3
5/-	Bridge, David Ord. ..	28/1½	16/3	27/6	28/–
5/-	Bright, John Ord. ..	13/10½	8/9	10/10½	11/–
2/-	Brit. Ind. Plas. Ord. ..	8/1½	4/9	7/7½	7/6
2/-	,, 10% (tax free) Pref.	5/9	4/8½	4/9	4/9
£1	British Xylonite Ord. ..	57/9	28/6	55/6	55/7½
£1	,, ,, 5% Pref.	15/6	14/–	14/9	15/7½
5/-	BTR Ind. Ord.	13/3	9/4½	10/3¾	10/3
£1	,, ,, 7½% Pref. ..	22/6	20/9	22/6	22/6
£1	Courtaulds Ord... ..	35/10½	20/–	33/3	35/–
£1	,, 5% 1st Pref.	18/6¾	15/7½	16/9	16/9
£1	,, 6% 2nd Pref.	19/6	17/1½	19/6	19/6
4/-	Cow, P. B. Ord. ..	6/7½	3/6	*5/10½	6/–
£1	,, 5% Pref. ..	13/9¾	10/9	13/3	13/9
5/-	Dale, John Ord... ..	16/3	10/–	11/4½	13/6
£1	,, ,, 6% Pref. ..	15/10½	13/–	15/7½	15/10½
1/-	Dannimac Mfg. Ord. ..	6/2¼	2/6	6/–	6/–
10/-	De La Rue Ord. ..	36/–	20/9	35/3	35/6
£1	,, ,, ,, 3½% Pref. ..	11/9	10/–	10/4½	10/3
6/8	Distillers Co. Ord. ..	27/–	15/9	25/3	26/3
£1	,, ,, 6% Pref...	21/7½	19/10½	21/–	21/6*
£100	,, 5% Conv. Loan	£96½	£91	£93¼	£94*
£100	,, 5½% Unsec. Loan	£94	£87 7/16	£93	£94*
10/-	Dunlop Rubber Ord. ..	29/10½	14/9	26/6	29/3
£1	,, 5½% Pref.	18/9	15/10	17/4½	17/6
£100	,, 3½% 1st Debs.	£75½	£67¾	£75	£75½
£100	,, 4½% 2nd Debs.	£82¾	£78	£82½	£82½
4/-	Ebonite Cont. Ord. ..	15/3	7/6	13/6	13/10½
£1	English China Clays Ord.	60/6	29/9	60/3	59/4½

Par Value	Company	1958-59 High	Low	April 25	Latest
£1	Goodyear Tyre 4% Pref.	12/9	12/–	12/6	12/6
5/-	Greeff Chem. Ord. ..	17/9	14/–	17/–	17/–
10/-	,, ,, 5½% Pref...	8/–	7/9	8/–	8/–
4/-	Greengate & Irwell Ord.	7/0¾	4/9	5/9	5/6
£1	Harrisons & Crosfield Dd.	61/3	43/9	60/–	58/9
1/-	Hunt & Moscrop Ord. ..	1/5	1/1½	1/3	1/3
£1	Imp. Chem Ord. ..	38/–	28/3	34/4½	34/4½
£1	,, ,, 5% Pref. ..	17/3	16/–	17/–	17/–
£100	,, 4½% Unsec. Loan	£88½	£80	£88	£87
£100	,, 5½% Conv. Loan	£121	£99	£115½	£117
1/-	Kleemann (O. & M.) Ord.	5/5½	2/6	5/–	5/3*
£1	,, ,, 6½% Pref.	16/9	15/–	16/6	16/7½
2/-	Lacrinoid Prod. Ord. ..	2/5½	1/5¾	2/–	2/–
5/-	Laporte Ind. Ord. ..	24/7½	13/7½	23/3	24/6
£1	,, ,, 7½% Pref.	22/10½	21/10½	22/9	22/9
£1	Leyland & Birm. Rubber Ord.	—	—	53/–	52/6
£1	,, ,, 6% Pref.	21/3	16/1½	16/10½	*16/10½
2/-	London Rubber ..	14/7½	8/6¾	14/0¾	14/6
£1	,, 6% Red. Cum. Pref.	19/9	16/3	18/9	18/9
£1	McKechnie Bros. Ord.	45/–	32/6	45/–	42/6*
£1	,, ,, 'A' Ord.	44/6	30/–	40/6	38/3*
£1	,, ,, 6% Cum. Pref.	17/–	16/–	16/3	17/–
5/-	Monsanto Chem. Ord. ..	16/4½	13/–	15/10½	16/–
£1	,, ,, 3¾% Pref.	13/–	11/–	12/6	13/–
£100	,, 6% Debs.	£104	£101½	£104	£104
£1	North British Rubber ..	—	—	15/3	15/3
5/-	Redfern Holdings Ord...	—	—	3/2½	3/6
2/-	RFD Ltd. Ord.	6/6	3/5½	6/6	6/3
£1	,, ,, 5½% Pref. ..	14/9	11/6	14/6	14/9
2/-	Rubber Imp. Ord. ..	15/6	4/9	8/–	5/6
2/-	,, ,, 'A' Ord.	14/3	4/6	7/9	5/–
£1	,, 5% 1st Pref.	12/3	10/–	10/–	10/–
5/-	Rubber Reg. Ord. ..	13/–	10/6	11/–	10/7½
4/-	Shaw Francis Ord. ..	18/–	9/9	16/4½	16/7½
2/-	Silentbloc Ord. ..	8/6¾	7/6	8/0¾	8/–
2/-	Sussex Rubber Ord. ..	1/8	7½	1/4½	1/4½*
5/-	Sutcliffe Speak Ord. ..	7/4½	5/–	6/10½	7/–
£1	Turner & Newall Ord. ..	76/4½	52/–	71/10½	71/10½
£1	,, ,, 7% Pref.	24/–	22/1½	23/3	22/7½*
5/-	Universal Asbestos Ord.	21/–	8/0¾	20/9	20/–
5/-	Viscose Dev. Ord. ..	10/7½	6/3	10/–	10/0¾*
5/-	Warne William (Holdgs.) (Ord.	12/9¾	8/–	11/9*	12/3

*Ex-dividend

Rubber Markets

LONDON

Prices in the London rubber market made further progress, mainly on Chinese and Russian buying, and showed further good gains at one time. The market reacted sharply, however, on reports that the United States stockpile may be reduced and although subsequently rallying on New York advices prices are lower on balance. The Spot is ⅛d. down at 30¼d. per lb., while prices generally are a similar amount lower. The distant forward positions, however, record rather larger falls.

Latest prices are as follows:

No. 1 RSS Spot: 30d.-30¼d.

Settlement House:

June 30¼d.-30⅜d.

July/September 30⅜d.-30½d.

October/December 30½d.-30⅝d.

January/March 29⅞d.-30⅛d.

April/June 29⅝d.-29⅞d.

No. 1 RSS cif basis ports:

May 30d.-30¼d.

June 30d.-30¼d.

Godown:

May 104½ Straits cents nominal.

LATEX

Centrifuged latex per gallon in drums, May/June shipment, 17s. 10d. seller, cif European ports. Spot, seller, 18s. 3d. Bulk, seller, 17s. 9d. Creamed, seller, 17s. 4d. Normal, seller, 13s. 5d.

AMSTERDAM

The Amsterdam rubber market ruled as follows on May 11:

	Guilders per kilo	
	May 11	Previous
May	2.95	2.95
June	2.95	2.95
July	3.00	3.00
August	3.00	3.00
September	3.00	3.00
July/September ..	2.95½	3.01
October	3.00	3.00
November	3.00	3.00

Sales: 15 Tendency: Quiet

DJAKARTA

Prices eased sharply on May 11 on liquidation and profit-taking reflecting the decline overseas. The close was weak with spot No. 1 priok nominally quoted at 28.00 rupiahs per kilo against Saturday's closing price of 31.40 buyers.

	Rupiahs per kilo	
	May 11	Prev.
Spot No. 1 Priok ..	28.00n	31.40b
Spot No. 2 Priok ..	27.25n	30.75b
Spot No. 3 Priok ..	26.50n	30.00b
No. 1 fine pale crepe	27.00n	27.00b

Tendency: Easy

BANGKOK

No. 1 RSS

The price for No. 1 RSS, at Bangkok on May 11 was 33.75 (34.50) US cents per lb.

NEW YORK

The following prices ruled in New York on May 11:

DEALERS' PRICES

US cents per lb.

	May 11	Previous
No. 1 RSS, May	36½b–36¾a	36⅜b–36½a
June	36½b–36¾a	36⅜b–36½a
No. 2 RSS, May	36 b–36¼a	36⅛n
June	36 b–36¼a	36⅛n
No. 3 RSS, May	35⅝b–35⅞a	35⅞n
June	35⅝b–35⅞a	35⅞n
No. 1 RSS, Spot	36½b–36¾a	36⅜b–36½a
No. 3 Amber blanket crepe, July	35a	34½b–34¾a
No. 1 latex, thin crepe, May	36n	36n
No 1 latex, thick crepe, May	36⅛n	36⅛n

FUTURES—REX CONTRACT

US cents per lb

	Close	Prev. close
May ..	36.00b–36.25a	36.50b–36.75a
July ..	36.20–36.30t	36.35b–36.50a
Sept. ..	36.00t	36.10–36.25t
Nov. ..	35.65b–35.80a	35.80t
Jan. ..	35.45b–35.60a	35.65b–35.75a
March ..	35.25b–35.35a	35.50t
May ..	35.05b–35.35a	35.40n

Sales: 130 Tendency: Very steady

Rubber futures were weaker on May 11 on active profit-taking induced by the decline abroad and nervousness over the possible change in Government stockpiling rotation of rubber policy. However, the market latterly recovered on short covering and trade buying when selling pressure subsided and more sober thinking about the effects of House Appropriation Committee's Friday statement on rotation of rubber. Most traders expressed the opinion that a Government law would be necessary to change the rubber rotation policy of GSA, and such an action if taken would take some weeks. Traders said that meanwhile underlying demand for rubber from factories continued good, although supplies of shipment rubber in market today were very scarce. Dealers reportedly were selling rubber to factories and covering the sales on the exchange or from previous natural rubber purchases.

CEYLON

No. 1 RSS

The price for No. 1 RSS, spot, at Colombo on May 11 was 129 (136) Ceylon cents per lb.

SINGAPORE

Prices were marked down five cents at the opening on May 11 on the United States stockpile news and fluctuated sharply in a nervous market. There was some interest in lower grades but sellers were reserved. Factories were small buyers. The market opened slightly higher in the afternoon. After small business at the noon levels, prices eased again on some nervous liquidation which was continuously absorbed by the trade. Physicals were difficult to obtain. After-hours, the market was slightly easier. Traders expressed surprise at the United States decision to end rotation buying of such perishables as rubber. Some fear this may be a practical way of releasing stockpile rubber although in theory it needs legislation and six months' notice to change any stockpile procedure. The majority of traders are of the opinion that any selling of deteriorating rubber is not going to alleviate the immediate shortage of stocks here but over the long term it should help to adjust the world shortage.

Straits cents per lb. fob Malayan ports to open ports

	Close	Previous Close
No. 1 RSS, May	102⅜–103	109⅛–109½
June	102⅛–102⅞	109 –109½
No. 2 RSS, May	101½–102	107½–107⅞
No. 3 RSS, May	99½–100	105½–106⅛
No. 4 RSS, May	98½– 99½	104½–105
No. 5 RSS, May	97 – 97½	102½–103⅛
No. 1 RSS, Spot	102½–103	108⅞–109⅛
No. 3 blanket thick remilled, May	97 – 99	101 –103
No. 1 fine pale crepe, May ..	105½–107½	111 –112
2X thin brown crepe, May ..	98½– 99½	102½–103½

Tendency: Slightly easier

The Industrial Syndicate quote latex, native produce, 60% centrifugal, packed in rec. drums fob at 212.80d. per gallon.

STOCK MARKET

Continued from page 759

ing that the current year may show some decline in net profit.

ALBRIGHT AND WILSON ordinary shares have changed hands at 25s., a gain of around 2s. 6d. on our previous quotation. Mr S. Barratt, the chairman, has stated that the general expectations of the board are that the company will experience an increase in total sales and profits during the current year, but 1959 will also be a year in which the company will have to undertake considerable capital outlay both at home and overseas. The current balance sheet shows an increase of around £1,000,000 in fixed assets at £18,564,000. The profit and turnover for the past year both established new peaks. The figures have already been published in this column but the net profit came out at £1,786,000 against £1,611,000 and the dividend was lifted by the equivalent of 1% to 17%.

From O. and M. KLEEMANN comes a final dividend of 7½% on the increased capital which brings the total for the year up to 20% against 25% on the smaller capital of a year ago. This certainly does not signify a turn round in the trading of the group. The directors have declared a 'special interim' of 10% on account of the current year so that the more accurate dividend comparison would read '30% against 25%.' Consolidated profit is up from £218,000 to £480,000. The 1957 total does not, however, include the profits of the Erinoid concern which became a subsidiary at the end of that year.

Industry INTELLIGENCE

Technical Data

Santocure, Santocure NS and Santocure MOR

Santocure is well known for its suitability as an anti-scorch accelerator in furnace black stocks, while Santocure NS and Santocure MOR, introduced more recently, offer even greater processing safety. Detailed information on the behaviour of these three accelerators in natural and synthetic rubber stocks is given in Technical Service Bulletin No. 11A/1, issued by Monsanto Chemicals Ltd., Monsanto House, 10-18 Victoria Street, London, S.W.1.

The first half of this 30-page report relates to the effect of the accelerators on the processing and vulcanizing characteristics of natural rubber, SBR and nitrile rubber stocks, all containing 50 phr of HAF black. In natural rubber and SBR, Santocure MOR showed the greatest margin of processing safety, followed by Santocure NS and Santocure. In nitrile rubber, there was little difference between the three accelerators in regard to processing safety, although MOH was slightly better than the others. In the natural rubber and SBR stocks, MOH was slightly less active in vulcanizing characteristics, but this could be corrected by increasing the amount of the accelerator.

The latter half of the report is concerned with various aspects of the use of the three Santocure accelerators, including the effects of accelerator content and sulphur content of the stocks, the use of secondary accelerators and of Curetard (a retarding agent), and the behaviour of the accelerators in a natural rubber/reclaim stock. The report concludes with recipes for compounds for tyre treads, general purpose mechanical mouldings, resin rubber soling, microcellular rubber soling and flooring, all recipes containing one of the Santocure accelerators.

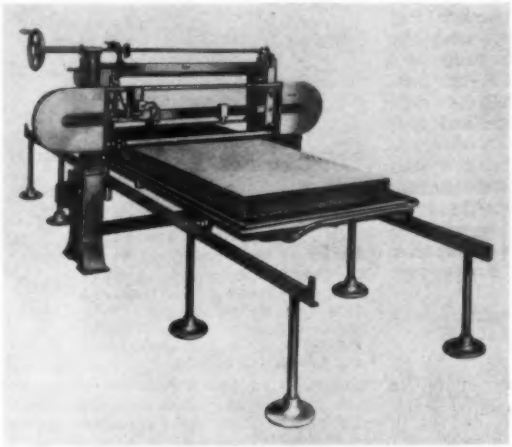
Compounding Neoprene for Moulded-on Shoe Soles

The compounding of Neoprene Type W for moulded-on soles for industrial and farm work shoes is discussed by R. W. Bedwell in Report BL-348, issued by the Elastomer Chemicals Department, E. I. du Pont de Nemours and Co. (Inc.), Wilmington 98, Del., USA. It is shown in the report that compounds which conform to a Mooney scorch curve of a particular configuration are suitable for use in making moulded-on soles. The determination of the Mooney scorch curve is therefore an economical and expedient method for evaluating compounds for use in this process. Recipes are given for four suitable compounds based on Neoprene Type W in all of which diethyl thiourea is used as the primary accelerator. Three of the compounds are of the non-marking type while the fourth compound is reinforced with 90 phr of SRF black. All the compounds are very fast curing and are therefore very scorchy according to the usual standards. However, with reasonable care, they may be mixed safely in either an internal mixer or on a mill, the diethyl thiourea being withheld for later addition whichever method of mixing is adopted.

Machines, Materials and Equipment

Foam Splitters and Cutters

F. J. Edwards Ltd., 359-361 Euston Road, London, N.W.1, have been appointed sole agents in the UK for the well-known 'Kuris' cutting and splitting machines, for soft and rigid foam plastics, foam rubber and similar materials. Details of the main models are as follow: The horizontal splitting machine, model RBW, has a capacity of 45in. or 63in. wide by 80in. long. The overall thickness clearance of material is approximately 19in., with the maximum thickness of slab above knife of 6in. Depending on the density of material, the minimum thickness of slabs is $\frac{1}{16}$in. This machine is now capable of handling polyether foams. The vertical cutting large band knife machine, model RBME, is capable of accommodating blocks up to 80in. in length. The standard cutting height is 13$\frac{3}{4}$in. and the clearance between knife and side stop is 39$\frac{3}{4}$in. and arm 49$\frac{1}{4}$in. The size of the metal rolling table is 86$\frac{3}{4}$in. x 82$\frac{3}{4}$in. The vertical cutting machine, model BKR, is for cutting smaller synthetic foam pieces. The standard cutting height is 7$\frac{7}{8}$in., and the size of the metal rolling table is 59in. x 47$\frac{1}{4}$in. The sponge cutter, model ZMB 58, is a portable machine, with a metal rolling table 55in. x 19$\frac{3}{4}$in. and a standard cutting height of 7$\frac{7}{8}$in. The clearance between knife and arm is 15$\frac{1}{2}$in. Most of the above models have a built-in knife sharpener and an automatic knife tensioning device. The cutting heights in each case can be increased considerably to special order.



A 'Kuris' foam cutting machine

Tyril 767

Tyril 767, a new styrene/acrylonitrile copolymer, with the transparency of general purpose polystyrene but, the makers state, much tougher, is now being marketed by British Resin Products Ltd. Tyril 767 can be both injection moulded and extruded. It possesses good heat resistance and is resistant to acids, many solvents and petrol. Available in natural as well as in a range of transparent and opaque colours, Tyril 767 gives an outstanding performance for a wide variety of applications where transparency and toughness, combined with high tensile strength and elongation, are essential. Tyril 767 can be used for the packaging of food, and it is particularly suitable for bristle and other monofilament applications. Other end uses include drinking tumblers, fan blades, household appliances, camera parts, oil and water filter components and low cost dinnerware. Copies of the Information Sheet on Tyril 767 can be obtained from Information Department, British Resin Products Ltd., Devonshire House, Piccadilly, London, W.1.

Publications Received

Teflon and Enflon

A catalogue and data sheet dealing with Teflon and Enflon stock and custom moulded, etc. materials, has been issued by the manufacturers, the Enflo Corporation, Maple Shade, New Jersey, US. Full details of properties and applications are given.

COMPANIES in the NEWS

Ikpoba Crepe

A net profit of more than £10,000 was made from sales of processed rubber, by the Ikpoba Crepe Factory, near Benin, between April 1958 and March this year. Announcing this, the firm said it sold over 2m. lb. of dry rubber to overseas companies and processed about 5m. lb. of wet lump crepe during the period.

Labu Cheviot Rubber Ltd.

In the course of his statement at the annual general meeting of Labu Cheviot Rubber Ltd., the chairman, Sir John Hay, said that Labu estate was now a delightful sight and would, when fully mature, be a first-class producing unit matched by few and excelled probably by none. In 1958 its average yield per mature acre was 1,088lb. The average rate of output for all properties was, in 1958, at the rate of 980lb. per acre. The 1958 crop was the largest ever produced by the company and was materially assisted by the extremely favourable weather during December, in which month bumper harvests were obtained over the whole country. In 1959 they hoped to obtain a crop of over 10,000,000lb. The price realized for rubber in 1958 was 2.83d. per lb. less than in 1957.

Bakelite Ltd.

The trading profit of Bakelite Ltd. for 1958 before taxation was £538,458 (£431,022). The proposed final dividend of 10%, together with the interim dividend of 5% already paid, makes a total of 15% less tax for the year, which is the same as for the previous year. The total sales during the year, both by weight and value, were higher than in any previous year. Our overseas trade in 1958 showed considerable improvement on the previous year, but because of the strong competitive conditions the profits derived, while higher than 1957, were not commensurate with the increase in sales. Both our subsidiary and associated companies in India enjoyed a successful trading year and have made a contribution to the company's profits. Work on new and better materials by our research and development staff continues with the objective of adding to our range and providing products for new end uses. We continue to maintain a well organized and efficient technical staff which is available to provide service to our customers. The company's sales for the first four months of the current year show an increase over the comparative figures of the previous year and profit margins have also been more than maintained on a similar comparative basis.

The report and accounts were adopted.

Mr A. R. Scott has been invited to join the board of Amalgamated Bruas Rubber Estates.

Rubber Crop Returns

HARRISONS AND CROSFIELD LTD.

Sumatra

	March 1959 lb.		No. of mths. of fin. year to date	Fin. year to date lb.	
Allied Sumatra	655,869	(704,810)	3	2,256,188	(2,401,570)
Asahan	121,252	(116,844)	8	978,842	(1,089,072)
Bah Lias	136,685	(198,414)	5	804,679	(1,086,868)
Central Sumatra	74,957	(88,185)	9	816,804	(928,137)
Lankat Rubber	57,319	(57,319)	12	742,289	(742,786)
Mendaris	145,503	(170,857)	3	551,150	(568,355)
Namoe Tongan*	83,775	(298,724)	7	1,545,425	(1,924,616)
Sialang	198,634	(181,879)	2	386,025	(368,609)
Soengei Rampah	41,887	(52,909)	3	149,913	(169,754)
Tanah Datar	59,524	(74,957)	3	207,232	(234,790)
Tandjong	143,299	(133,852)	9	1,360,176	(1,293,936)
Toerangie	171,959	(220,460)	5	1,029,548	(1,135,369)
United Lankat	25,904	(28,660)	3	83,554	(90,389)
United Serdang†	725,314	(886,249)	7	6,399,072	(7,302,737)

* The larger of the company's two estates, Sungei Rumbija, was out of production during March following an attack by an armed band on March 1 1959. The crop of that estate for February, being unknown, is also excluded from the total crop to date.

† Nagodang estate (1,238 acres) has been out of production for three months following a series of attacks by armed bands.

Malaya and Borneo

Castlefield	236,000	(208,500)	9	2,115,500	(1,905,500)
Golden Hope*	632,500	(591,000)	1	632,500	(591,000)
Holyrood	57,500	(52,000)	3	201,000	(188,100)
Hongkong	25,300	(18,500)	3	80,500	(58,800)
Hoscote	214,100	(214,800)	9	2,183,000	(2,127,700)
Killinghall	42,000	(31,000)	9	392,600	(324,800)
Kuala Selangor	53,000	(46,000)	3	169,000	(141,000)
Kulai	196,000	(159,000)	5	1,008,000	(744,500)
Lanadron	359,300	(368,000)	3	1,161,000	(1,128,100)
London Asiatic	1,305,400	(1,218,500)	3	4,306,400	(3,921,500)
Malaysia	42,500	(50,500)	3	142,000	(185,000)
New Crocodile	199,000	(218,000)	1	199,000	(218,000)
Pataling	997,000	(872,500)	5	5,756,500	(4,778,500)
Prang Besar†	206,300	(173,100)	12	2,307,100	(1,963,400)
Sandac	81,500	(86,000)	12	917,500	(890,000)
Sapong	142,000	(111,000)	3	424,000	(380,000)
Seaport	64,000	(68,000)	9	698,000	(706,000)
Strathisla	88,000	(77,000)	9	946,000	(794,000)

* Includes Klanang Bahru crop since January 1 1959.

† Includes Bukit Prang crop since January 1 1959.

South India and Ceylon

Malayalam	269,600	(306,500)	12	6,969,800	(6,878,900)
Lunuva	89,821	(95,942)	3	317,265	(345,146)

Java

	January 1959 lb.		Mths. of fin. year to date	Fin. year to date lb.	
Bajoe Kidoel	273,367	(245,612)	10	2,168,411	(2,158,052)
Djasinga	116,643	(117,734)	7	810,407	(848,793)

	March 1959 lb.		No. of mths. of fin. year to date	Fin. year to date lb.	
Mengkibol	70,000	(64,000)	3	235,000	(213,000)
Sedenak	200,000	(165,000)	5	969,000	(891,000)
Malaya General	182,000	(148,000)	7	1,463,000	(1,127,000)

	Fin. year to date lb.		No. of mths. of fin. year to date
Elpitiya	691,107	(573,428)	6
Kolmalie Valley	425,300	(511,480)	9

	March 1959 lb.		Mths. of fin. year to date	Fin. year to date lb.	
Scottish Malayan	319,800	(348,600)	3	1,042,300	(1,123,000)

	March 1959 lb.		Mths. of fin. year to date	Fin. year to date lb.	
Kemasul	34,400	(39,050)	3	117,100	(121,150)
Inch Kenneth Kajang	123,000	(143,000)	3	441,000	(498,000)

	March 1959 lb.
Kuala Reman	172,500

British Standards

Brass Eyelets and Washers

Brass eyelets and their associated washers are used extensively on tentage and miscellaneous textiles, leather, rubber and plastics goods having an approximate thickness of ⅛in. to ¼in. Now there is a 34-pp. standard for them, BS 3102, 'Brass eyelets and washers for general purposes.' The new publication specifies the materials, quality and finish of eyelets and washers, together with full dimensions (inch and metric) of each component.

Rubber Safety Boots

BS 1,870, Part 2: Rubber safety boots, deals with footwear of the laced rubber ankle pattern and the knee-length pattern. Each type may be made in either of two forms of construction: compounded rubber latex or calendered sheet rubber compound. The 10-page publication specifies minimum qualities for the materials used, together with construction details and the necessary tests and test requirements.

Among the searching tests is one for protection against blows on the toe, to prove that the toe cap is to Grade 1 of BS 953, 'Strength Tests for Protective Toe Caps,' and a leakage test is designed to ensure the entire boot is waterproof. Again, the rubber components are also tested for their tensile strength and elongation, both before and after either of two forms of artificial ageing. The uppers in their turn are submitted to a large number of continuous flexes (80,000 to 100,000, depending on thickness), to ensure good materials and good manufacture.

Copies of this Standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. Price 4s. (Postage will be charged extra to non-subscribers.)

Non-Silver-Staining Natural Rubber Compounds

Five natural rubber vulcanizates primarily intended to meet the requirements of Government Departments are specified in this new British Standard, BS 3106, 1959: Non-Silver-Staining Natural Rubber Compound. These compounds, which are classified by their hardness, have been designed for items where it is necessary to minimize tarnishing or corrosion of metal parts with which they may come into contact. Such articles might include sheets, washers, strip gaskets, moulded articles or wrapped tubing.

The document includes test requirements for hardness, tensile strength, compression set, accelerated ageing and silver staining. Copies of this Standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. Price 3s. (Postage will be charged extra to non-subscribers.)

Copies of these standards may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. Price 3s. Postage will be charged to non-subscribers.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

TRANSWRAP (782,760) For covers and bags, all made of plastics and for hanging clothes. By the South Yorkshire and District Co-operative Laundries Association Ltd., Bellhouse Road, Shiregreen, Sheffield. (Class 24; March 25 1959.)

HOWFLEX (784,432) For plasticizers, being chemical products for industrial use. By Howards of Ilford Ltd., Uphall Works, Uphall Road, Ilford, Essex. (Class 1; April 1 1959.)

NACTOP (B775,850) For sealing caps made principally of cork or of plastics for containers. By Le Bouchon 'Rapid,' 'Les Barcins,' Cusset, Allier, France. Address for service is c/o Eric Potter and Clarkson, 317 High Holborn, London, W.C.1. To be associated with No. 775,849 (4196, 1266). (Class 20; April 1 1959.)

POLYNALE (780,480) For common metal nails with heads made of or coated with plastics. By Wall and Leigh (Thermoplastics) Ltd., Mill Street, Darlaston, Staffordshire. (Class 6; April 1 1959.)

PRIMROSE (770,371) For parts and fittings included in Class 12 for land vehicles, none being made wholly or principally of rubber or gutta-percha. By PPP (Clitheroe) Ltd., Primrose Works, Primrose Road, Clitheroe, Lancashire. (Class 12; April 1 1959.)

'SWEET MEMORIES' (781,559) For shaped covers for cushions, being goods made from plastics (non-textile). By Leonard Thomas Trueman, trading as the 'Grand Rapid' Manufacturing Co., 36 Woodland Road, Thornton Heath, Surrey. (Class 24; April 1 1959.)

PERMEX (778,265) For articles made of plastics and included in Class 26; none being textile goods; but not including buttons or shirt and dress clips or any goods of the same description as buttons or shirt and dress clips. By Excello Ltd., 142-143 Hockley Hill, Birmingham 18. (Class 16; April 1 1959.)

(B781,861) For material in sheet form and covers made therefrom for protecting goods during transport, all made principally of plastics and included in Class 17. By EPS (Research and Development) Ltd., Staplehurst Road, Sittingbourne, Kent. To be associated with No. B761,452 (4128, 884) and others. (Class 20; April 1 1959.)

POLYZOTE (774,217) For plastics in the form of powders, pastes, liquids, emulsions, dispersions and granulates, all for industrial purposes. By Expanded Rubber Co. Ltd., 675 Mitcham Road, Croydon, Surrey. To be associated with No. 630,974 (3488, 54). (Class 1; April 8 1959.)

HIFI (773,603) For poly-vinyl-acetate paints. By Harrison S. Walton and Son Ltd., Suffolk Works, Cardigan Street, Birmingham, 4. (Class 2; April 8 1959.)

CLE'MENT ENNWELL (783,697) For cycle tyres. By The Canex Co. Ltd., 112 City Road, London, E.C.1. To be associated with No. 733,870 (3995, 1296). (Class 12; April 8 1958.)

BOLTARON (783,056) For plastics included in Class 17. By The General Tire and Rubber Co., 1708 Englewood Avenue, Akron, Summit, Ohio. Address for service is c/o Mewburn, Ellis and Co., 70-72 Chancery Lane, London, W.C.2. (Class 17; April 8 1959.)

SIDAPLAX (778,383) For small domestic utensils and containers (not of precious metal or coated therewith) and toilet sets, and parts of all these goods included in Class 21; and toilet powder flasks, bottles (sold empty) and dispensing caps made of plastics for the aforesaid flasks and bottles. By Sidaplax Société Anonyme, 4 Chaussée de Charleroi, Brussels, Belgium. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 21; April 8 1959.)

VYNOFLEX (784,010) For articles of clothing. By Greengate and Irwell Rubber Co. Ltd., Greengate Works, Greengate, Salford. To be associated with No. 783,972 (4213, 374). (Class 25; April 8 1959.)

The 'Home, Garden and Garage' hose has been introduced by the Goodyear Tyre and Rubber Co. The hose, with a smooth ¾in. bore for easy draining and the outside grooved for easy handling, is manufactured in light blue plastic. A feature of the special reel supplied with the 60ft. length is that it is so designed that the nozzle is drawn from the centre, leaving the unwanted hose neatly stored on the reel when the complete length is not needed. The price of this hose, comprising reel and 60ft. length of hose, is 40s. complete

PATENT LIST

Printed copies of the Specifications in the following list can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on May 6 1959

Imperial Chemical Industries Ltd. Brightening of aromatic fibre and film forming polyesters. 813,093.

Imperial Chemical Industries Ltd. Polymerizable ester and polymers obtained therefrom. 812,983.

E. I. Du Pont de Nemours and Co. Polymeric films. 812,972.

Chemische Werke Hüls A.G. Mould for production from thermoplastic synthetic materials of cellular articles having closed cells. 812,844.

United Aircraft Corporation. Cured natural or synthetic rubber compositions. 813,115.

Potteries Ventilating and Heating Co. Ltd. Moulding of bends in pipes or ducts from glass fibre and resin. 812,956.

Open to public inspection on May 13 1959

Agricola Reg. Trust. Extensible reinforced expanded plastic. 813,311.

Permacel Tape Corporation. Polymerizing organopolysiloxanes. 813,313.

Dunlop Rubber Co. Ltd. Apparatus for making pneumatic tyres. 813,376.

E. I. du Pont de Nemours and Co. Molecular orientation of tetrafluoroethylene polymer films, fibres or filaments. 813,331.

E. I. du Pont de Nemours and Co. Making shaped articles from polyhalogenated ethylene polymers and copolymers thereof. 813.332.

B.F. Goodrich Co. Thermoplastic resinous compositions. 813,447.

EMB Co. Ltd. Control means for metal die-casting or plastic moulding machines. 813,382.

O'Sullivan Rubber Corporation. Laminates and process for the production thereof. 813,187.

G. A. Butler. Automatic plastic sealed valves. 813,191.

London Rubber Co. Ltd. Toy balloons and like inflatable articles. 813,193.

Monsanto Chemical Co. Vulcanizable rubber compositions and vulcanized rubbers produced therefrom. 813,141.

Firestone Tire and Rubber Co. Polymerization of isoprene. 813,198.

Kabushiki Kaisha Meiki Seisakusho. Injection-moulding machines. 813,208.

Cable Belt Ltd. Conveyers. 813,210.

E. I. du Pont de Nemours and Co. Linear copolyesters and composite structures including such copolyesters. 813,212.

COUNTY COURT JUDGMENTS

NOTE.—*These Judgments which are supplied from the Registry of County Court Judgments, Lord Chancellor's Department, 3 Dean's Yard, London, S.W.1, are not necessarily for debt, and some may have since been satisfied. They may be for damages or otherwise, they may relate to actions bona fide contested between the parties, or they may be against defendants liable in a representative capacity and not personally; but no distinction is made on the register. A judgment does not imply inability to pay. Judgments are not returned to the Registry if satisfied in Court Books within twenty-one days.*

THE NORTHERN ASBESTOS CO. LTD., R/O Dawes Lane, Scunthorpe, Lincs. Scunthorpe and Brigg. £65 12s. 6d., December 22 1958.

THE NORTHERN ASBESTOS CO. LTD., R/O Dawes Lane, Scunthorpe, Lincs. Scunthorpe and Brigg. £38 3s. 9d., December 22 1958.

LCF PLASTICS, 6 Stewart Road, London, E.10. Bow, £29 1s. 8d., April 29 1958.

THE RUBBER CRAFTS CO., 639 Westwood Heath Road, Birmingham, 8. Birmingham, £27 10s. 6d., December 19 1958.

WILLIAMS TYRE SERVICE, 634 Harrow Road, London, W.10. Westminster, £43 9s. December 15 1958.

RUBBER ASBESTOS AND FLOORINGS LTD., 3 Bridge End, Leeds 1, Yorks. Leeds. £26 14s., January 8 1959.

RUBBER ASBESTOS, FLOORING CO., Bridge End, Chrs. 3, Bridge End, Leeds 1, Yorks. Liverpool. £51 18s. 6d. January 5 1959.

W. HIGGINS (Male), (T/A MERSEYSIDE PLASTICS), 11 Burwen Drive, Liverpool 9, Lancaster. Wolverhampton. £49 14s. January 26 1959.

G. HOYLE, trading as Southern Sales and Exchange, West Wycombe Road, High Wycombe, Bucks., tyre dealer. Oxford. £190 13s. 9d. February 16 1959.

RUBBER ASBESTOS AND FLOORING LTD., R/O Bridge End Chambers, 3 Bridge End, Leeds 1, Yorks. Uxbridge. £29 12s. February 20 1959.

NEW COMPANIES

Flexo Plastic Industries Ltd. (624,626).—April 1. Capital: £100 in £1 shares. To carry on the business of importers, exporters and manufacturers of and dealers in plastics, etc. Solicitors: Theodore Goddard and Co., 5 New Court, Lincoln's Inn, London, W.C.2.

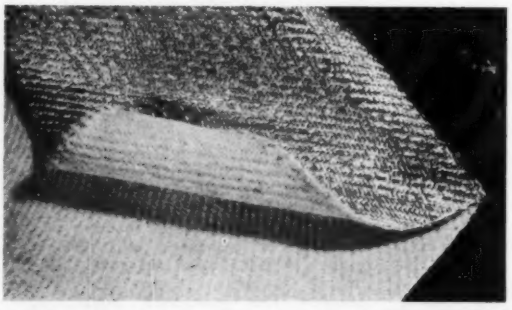
Paragon Plastics Ltd. (624,754).—April 2. Capital: £500 in £1 shares. To carry on the business of manufacturers of and dealers in plastic fittings for use in the plumbing and engineering trades, etc. The first directors are to be appointed by the subscribers. Regd. office: Cross Bank, Doncaster.

BAC (Plastics) Ltd. (624,831).—April 3. Capital: £1,000 in £1 shares. The directors are: Robert Schrecker and Gertrude Schrecker, both of 115 Princess Court, Bayswater, London, W.2, directors of BAC Trading Co. Ltd., etc. Regd. office: 57 Cowcross Street, E.C.1.

Pura Plastics (Eastbourne) Ltd. (625,250).—April 7. Capital: £2,000 in 200 shares of £10. The directors are: Edward T. Pulleng and Doris E. Pulleng, both of Blackwater Hotel, Eastbourne; Robert H. West and Mrs Nancy West, both of 42 Northbourne Road, Eastbourne. Regd. office: 1 Upperton Gardens, Eastbourne.

Telecoil Sales Ltd. (625,278).—April 7. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in insulating and plastic substances and materials of all kinds, etc. The directors are: George First, 12 De Frene Road, London, S.E.26; Solomon Stern, 69 Beaufort Park, Beaufort Drive, London, N.W.11. Regd. office: 43 Upper Berkeley Street, London, W.1.

A. and G. Plastics Ltd. (625,833).—April 14. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastic materials of all kinds, etc. The first directors are: George H. Day and Mrs Alice Day, both of 69 Nobes Avenue, Bridgemary, Gosport, Hants. Regd. office: Mumby's Yard, Gosport, Hants.



Turner Brothers Asbestos Co. Ltd. of Rochdale, Lancs., have announced an addition to their range of woven asbestos cloths, among which several qualities are now available having a coating of bright and highly reflective aluminium. This innovation is evoking a great deal of interest throughout industries concerned with thermal insulation problems of diverse kinds, particularly those connected with ship-building and marine refit, as well as gas turbine and aircraft manufacture. These special fabrics are also being adopted for fire-fighting and other protective clothing applications

Latest Wills

Sir John George Beharrell, K.B., D.S.O., of St. Andrew's, Southdown Road, Harpenden, Herts., former chairman of the Dunlop Rubber Co., financial adviser to the Geddes Committee on National Expenditure, 1921-22, president of the Society of Motor Manufacturers and Traders, 1927-29, of the Federation of British Industries, 1932-33, and of the Institution of the Rubber Industry, 1933-36, who began work in the clerical department of the North-Eastern Railway at the age of 15 years at £15 a year, died on February 20 last, aged 85 years, leaving £85,974 gross, £84,067 net. (Duty paid £35,109.)

Mr Claude Seymour Sargent, of 4 Wrotham Road, Gravesend, Kent, and Hillcrest, Istead Rise, Northfleet, Kent, late of the Gravesend Rubber Co., who died on January 3 1959, left £14,896 gross, £14,629 net. (Duty paid £207.)

Mr Henry Berry, of 5 Delamere Road, Ainsdale, Southport, Lancs., chairman of Leyland and Birmingham Rubber Co. Ltd., and Pilot Assurance Co. Ltd., former member of Lancashire County Council, who died on January 6 1959, aged 82, left £129,608 gross, £127,299 net. (Duty paid £63,909.)

Rubber Journal and International Plastics CLASSIFIED ADVERTISEMENTS

APPOINTMENTS WANTED

6d. a word, Minimum 10/- Box 2/-

L.I.R.I., 26, studying for A.I.R.I. seeks progressive position preferably in South-East Lancashire area.—Box 33. (33)

AGENCIES and REPRESENTATIVES

6d. a word, Minimum 12/6 Box 2/-

WITCO CHEMICAL COMPANY LIMITED require experienced representative to cover rubber trade Greater London area and South-West England. Some technical knowledge desirable. Applicants must be resident London area. Excellent prospects for right man.—Apply by letter Managing Director, Bush House, W.C.2. (43)

ARTICLES WANTED

6d. a word, Minimum 12/6. Box 2/-.

SECOND-HAND Berstoff continuous vulcanizer required. Full details to:—Box 35. (35)

ARTICLES FOR SALE (SECONDHAND)

6d. a word, Minimum 12/6 Box 2/-

VENTILATION fans, blowers, dust/fume extractors, compressors, presses, at real money-saving prices. Literature available. Enquiries welcomed.—Bellangers, 306 Holloway Road, London, N.7. North 4117. (37)

2,000-TON 6-daylight press, platens 12ft. 6in. x 7ft. 9in. with self-contained pump unit. 1,000-ton 5-daylight press, platens 8ft. x 4ft. with self-contained pump unit.—Reed Brothers (Engineering) Ltd., Replant Works, Woolwich Industrial Estate, London, S.E.18. Telephone: Woolwich 7611/6. (41)

600

COMPRESSOR SETS

400 c.f.m. BROWETT LINDLEY 120 p.s.i. with LAURENCE SCOTT 95 h.p. slipring motor, 400/3/50.
TWO—330 c.f.m. BROOM AND WADE 100 p.s.i. with BROOK 75 h.p. slipring motor, 400/3/50.
230 c.f.m. INGERSOLL RAND 100 p.s.i. with L.D.C. 60 h.p. slipring motor, 400/3/50.
156 c.f.m. INGERSOLL RAND 100 p.s.i. with BROOK 40 h.p. slipring motor, 400/3/50.
Many others in stock. Capacities 5/2,400 c.f.m. at 100 p.s.i.

GEORGE COHEN SONS & CO., LTD.,
WOOD LANE, LONDON W.12.
Tel.: Shepherds Bush 2070 and
Stanningley, Nr. Leeds, Tel.: Pudsey 2241. (42)

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

AN estimator, fully experienced with the manufacture of general rubber goods is required by a rubber company near Manchester. Apply giving age and other details to:—Box 39. (39)

BRITISH company invites applications from rubber technologists, A.I.R.I. or L.I.R.I., age 21-26, for appointment as assistant manager of latex factory in Malaya. Minimum salary and allowances £850 p.a. plus furnished accommodation. Provident fund and generous annual commission. Good promotion prospects.—Full details to Box C210, c/o Streets, 110 Old Broad Street, E.C.2. (32)

GEORGE ANGUS AND CO. LTD. require a senior draughtsman as section leader responsible to chief engineer of rubber and plastics factory at Walker-on-Tyne, for supervision of small drawing office and quick production of drawings and sketches of new and modified equipment. Applicants should be able to work on own initiative obtaining details direct from the shops. An attractive salary will be paid to recognize responsibility and there is scope for advancement in an expanding group employing 2,500 people. Applicants should preferably be between 28 and 35 years of age, have obtained H.N.C., and have had some experience in the rubber industry. The company operates pension and house purchase schemes. Applications should be sent to:—Appointments Officer, George Angus and Co. Ltd., P.O. Box 139, Newcastle upon Tyne. (34)

LATEX chemist is required by Greengate and Irwell Rubber Co. Ltd. for their latex division at Melton Mowbray to take charge of routine laboratory and development in a rapidly expanding factory. Superannuation scheme; excellent prospects. Please reply in confidence to:—General Manager, Latex Division, Melton Mowbray, Leics. (18)

MILL room foreman required to take charge of expanding production of natural and synthetic rubber compounds and also large spreading shop at a Midlands factory. Write stating age, experience and salary required to:—Box 31. (31)

PRODUCTION manager required for plastic foam factory in Manchester area. Necessary qualifications are an alert and observant mind, cost consciousness, ability to plan and execute orders on time, discipline of labour and general common sense. Some knowledge of rates study would be an asset. No technical qualifications necessary. Staff appointment, pension, etc. Starting salary £850—£1,000 with good prospects.—Box 36. (36)

THE John Bull Rubber Company invite applications from graduate chemists, physicists and engineers, who have completed National Service, for positions in their laboratories, or those of their associated companies. The successful applicants will spend their first year in the company's employ taking a full-time course at the National College of Rubber Technology leading to a diploma of the Institution of the Rubber Industry. Thereafter duties will comprise research, development and/or factory investigations. Initial salary will not be less than £600 a year, exclusive of tuition fees. Write in confidence to:—The Technical Director, The John Bull Rubber Co. Ltd., Evington Valley Mills, Leicester. (38)

MISCELLANEOUS

6d. a word, Minimum 12/6 Box 2/-

AVAILABLE regular supplies 20s/30s/40s mesh tyre crumb.—Box 385. (385)

'COTSWOLD' dipping machines and circulating tanks for latex and PVC. New catalogues now available on request.—Lionel Hook and Sons, Ebley, Stroud, Glos. Tel.: Stonehouse 614/5. (380)

MANUFACTURERS of roughing machines for rubber sheeting, sponge rubber, splitting machines, leather cloth plant, embossing plates and rollers, spreading machines and presses.—G. L. Murphy, Ltd., Imperial Works, Menston, Nr. Leeds. (238R)

MILLING compounding capacity available. Large or small quantities.—Fleet Rubber Products Ltd., 12-18 Fleet Road, Fleet, Hants. Fleet 1607. (40)

MOULDING capacity available. Competitive prices. Prompt delivery.—Fleet Rubber Products Ltd., 12-18 Fleet Road, Fleet, Hants. Fleet 1607. (40A)

NEW—HANDY . . .

LK Plastic Welding Tools

No compressor required. Hot airstream, 180°-500° C., simply by connecting to mains supply.

For hard and soft P.V.C., Polythene, etc. Under 2½ lbs., can be carried in a briefcase. Also available; LP Welding Pistol, 12½ ozs. Chamfering & Cutting Tools, Feedrollers and Heat Impulse Sealing Tools.

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